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ABSTRACT

This document contains three reports in prepublication form on research conducted by linguists at the University of Colorado. The first paper presents an argument against the theories concerning the concept of the distributional syllable. Such theories are based on the assumptions that the syllable can and should be defined formally, without reference to phonetic realization and that the syllable is not an independent unit, but rather is derivable from the distributional properties of segments. The author argues that the theories based on these assumptions do not exhibit a reasonable conformity with the phonetic facts and that they cannot provide a basis for generalizations about phenomena beyond those for which they were specifically intended. The purpose of the second paper is to prove that stress in Aragonese is a completely predictable phenomenon and to postulate a stress rule that will account for the various stress patterns of Aragonese. The final paper considers the Russian verb "byt" and sees in it four different verbs according to the four different functions that it performs. (VM)

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AGAINST THE DISTRIBUTIONAL SYLLABLE[1]

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ABSTRACT

In the past 20 years, Kuryłowicz, O'Connor and Trim, Arnold, Haugen, Greenberg, and Pulgram have advocated theories of the distributional syllable. The theories are based on two assumptions: The syllable can and should be defined formally, without reference to phonetic realization; and the syllable is derivable solely from the distributional properties of segments.

It is argued that theories of the distributional syllable are unsuccessful, both because they are not in reasonable conformity with the phonetic facts, and because they do not appear to be capable of supporting generalizations about phenomena beyond the segmental phonotactics on which they are based.

The nature of their failures suggests that the assumptions of the distributional syllable are unwarranted. It should be more promising to assume that segment and syllable are independent constructs; and that segments are organized in terms of syllables both phonetically and at more abstract levels.

1. The assumptions of the distributional syllable. 'Defining the syllable' has been a traditional task in linguistics, perhaps like 'squaring the circle' was to the geometers. It is attempted, it is done, but it remains to be done ever again. There is a particular genre within this tradition that is represented by a series of works spanning two decades whose authors represent a variety of linguistic schools: Kuryłowicz (1948), O'Connor and Trim (1953), Haugen (1956a,b), Greenberg (1962), and Pulgram (1969).[2] All have in common two basic assumptions: first, the syllable can and should be defined formally, without reference to phonetic realization. Second, the syllable is not an independent unit, but is derivable from the distributional properties of segments. I will thus call them definitions of the distributional syllable.

I think that these assumptions are questionable, and in particular, that the definitions of the distributional syllable afford them little support. I have no intention of refuting or disproving the definitions. As formal and self-contained constructs they are virtually immune to refutation anyhow except on grounds of internal inconsistency. I argue instead that they are unsuccessful theories, from two points of view. First, they do not meet the criterion for a successful phonologic theory imposed by Greenberg (1962) upon himself, reasonable conformity with the phonetic facts. Secondly, they have not met and appear to be incapable of meeting an equally important criterion: the ability to provide a basis for generalizations about phenomena beyond those for which they were specifically intended, in this case phenomena beyond segmental phonotactics.

2. Syllabicity. The definition of the syllable can be divided into two parts, syllabicity and syllabification. I will first discuss the problem

of syllabicity, how to distinguish syllable nucleus from syllable margin.

2.1 The procedure of O'Connor and Trim. Pike's (1943:78) distinction between vowel and vocoid underscores a fact that linguists now commonly recognize: that the syllabicity of a segment cannot generally be predicted from its other phonetic features. On the other hand, a theory of the distributional syllable would maintain that the syllabic and non-syllabic segments of a language could be distinguished entirely by their formal distributional properties. O'Connor - Trim and Greenberg have proposed explicit procedures to make this hypothesis operational.

Both approaches start from the valid observation that speech segments are not strung randomly in sequence; but rather that marginal and nuclear segments more commonly alternate than succeed each other.

The alternation of margin and nucleus is nicely exemplified by a hypothetical language whose word canon is $[CV(C)]^n$. Call it language A. I will use it to demonstrate the mechanics of the two methods.

O'Connor-Trim take the first two and the last two positions of the word as defining. They compute the number of contexts each phoneme has in common with every other phoneme in each position. For example, if t occurs before all five vowels of a language in initial position, and b occurs before all except u, then in initial position the pair t-b have four contexts in common. Let us assume that language A has 5 segments of class V, and 20 segments of class C, and that they combine freely within the limits of the canon. As Table 1 shows, every pair in the class C will have, in the four positions, 5, 0, 5, and 5 contexts in common, a total of 15, or 100% of the number possible. Pairs from class V will have 0, 20, 20, and 20 contexts in common, again 100%. But no segment in C will have a common context with any segment in V, although both

occur in the final two positions. No other two classes of phonemes will show this pattern.

Table 1. O'Connor-Trim syllabicity in language A.

Classes of segment pairs	Common contexts by position				
	Initial	Post-initial	Pre-final	Final	
C - C	5	0	5	5	100%
V - V	0	20	20	20	100%
V - C	0	0	0	0	0%

2.2 Greenberg's procedure. Greenberg constructs a function called the 'maximum recurrence interval' to distinguish vowel from consonant. For a given class of phonemes, the maximum recurrence interval is the length of longest sequence of phonemes not belonging to the class that can occur between two members of the class or between a member and initial or final position. Greenberg's rationale for the use of this function is that 'since the maximal length of the sum of the margins of the syllable is necessarily greater than the center, the maximal interval for ... [the] recurrence [of nuclei] will always be larger than for the consonant class'. The class of nuclei is then defined as the smallest class of segments meeting two conditions: it must have a higher maximum recurrence interval than any other class, and every sentence must contain at least one of its members. In our language of illustration, the maximum recurrence interval for the class C is 1 (e.g. #CVC), and that for the class V is 2 (e.g. #CVCCV#). Furthermore, V is the smallest qualifying class, for if one of its members is removed, then there will be sentences in which the new reduced class does not occur.

2.3 Defects of the procedures: marginless syllables. The major weakness of the procedures is that they do not yield a classification into margin and nucleus which accords with phonetic realization for certain language

types where alternation of margin and nucleus is less prominent than in language A. Languages possessing syllables without margins are such a type.

These languages are necessarily difficult for the O'Connor-Trim procedure. One reason for choosing initial and final positions was to avoid counting intersyllabic contexts. This cannot be avoided, since it is certainly possible for a language to exhibit both nuclear and marginal sequences in initial and final positions. When this occurs, statistics based on common contexts of occurrence do not lead to a clear separation of margin and nucleus. I do not offer an illustration, partly because realistic examples are complex, partly because it has already been done. Arnold (1964), after unsuccessfully applying the procedure to Greek and Polish, concluded that it could only be expected to be successful for certain types of languages.

The conceptual basis for the O'Connor-Trim procedure is that distributional constraints on segments, particularly within syllables, are strongly determined by their membership in the classes of margin and nucleus, which is surely true. This concept could be implemented by finding an explicit measure of similarity of distribution between a pair of segments, and then grouping segments into two categories, called margins and nuclei, according to their similarity of distribution. The similarity between pairs of margins and the similarity between pairs of nuclei is in general assumed to be greater than the similarity between margin-nucleus pairs. A necessary condition for such a procedure to qualify as a formal definition of consonant and vowel is

(1) There exists, for any pair of segments in a language, a universal measure of similarity of distribution that leads, by some given clustering procedure, to a margin-nucleus categorization of the segments.

This implies that there is some set of universally definable contexts over which the margin-nucleus classification invariably dominates the many other

segment classifications as a determiner of distributional constraints.

There is no reason to believe that (1) holds. O'Connor and Trim's only explicit claim was to have found a procedure that was successful for English. Arnold (1955-56) was able to apply it also to French. But neither the original measures nor certain modified ones were successful when Greek and Polish were included (Arnold 1964).[3]

Although it has been much less influential, Greenberg's algorithm is superior in many respects to the statistical definition of O'Connor-Trim. His recurrence function is carefully constructed so that it will apply to any language, whereas the computational procedures of O'Connor-Trim are ad hoc and admittedly unsophisticated.

Greenberg's algorithm also automatically assigns the labels 'margin' and 'nucleus' to the classes it distinguishes, whereas the O'Connor-Trim procedure is only designed to distinguish two classes. They do point out that in English one class should be designated as nuclear because it is less common initially and finally, its members occur in sequence less often than those of the other class, and because some words contain only its members. However, Greenberg incorporates these tendencies of nuclear segments in a general and explicit way. Thus the difficulties encountered by his procedure may also be assumed to be a problem in the O'Connor-Trim approach.

A language type for which the Greenberg procedure gives unacceptable results is illustrated by language B. Language B has no sequences of marginal segments. Sequences of syllabic nuclei occur. No words consisting only of vowels are found in language B. This type of structure can be found in Hottentot, for example (Beach 1938). Occurring words are #CV#, #CV.V#, #CVCV#, #CVC#, etc.; nonoccurring are *#V#, *#CCV#, *CVCCV#, etc.

The maximum recurrence interval for the marginal elements is 2, 3, 4, or however many syllable nuclei can occur in sequence, e.g., in #CV.V#.

The interval for the class of nuclei is 1, e.g., in #CV.V#, since there are no clusters of consonants. The procedure thus assigns the formal label 'vowel' to the margins, and 'consonant' to the nuclei. The labels would similarly be reversed for a language like Guarani, in which sequences of two consonants and up to three nuclei can occur (Gregores and Suarez 1967). It is not unreasonable to suppose that there may exist languages whose maximum sequences of margins and nuclei are of the same length, and which contain no words of vowels only (although I know of no example). In such a case, the procedure would either not distinguish two classes, or else by virtue of unrelated distributional gaps, would distinguish entirely irrelevant classes.

What happened? The overt conceptual basis for the procedure, that a syllable does not have fewer marginal segments than nuclear segments, is sound enough.[4] However, the procedure also depends crucially upon the further hypothesis,

> (2) If there occur longer sequences of nuclei than sequences of margins in a language, then there will occur words composed only of nuclei.

This generalization does not hold.

2.4 Defects of the procedures: segments which may be syllabic or not.

The treatment of segments which may be either syllabic or nonsyllabic (most commonly high vocoids or sonorants) is difficult for any formal distributional theory. If both syllabic and nonsyllabic forms are represented at the given level of analysis, then no new problems arise. But frequently the two functions do not contrast, and both have the same formal representation. How could a formal method distinguish the nuclei of a sequence in this case? It is of course possible to maintain that it is unreasonable to require of a formal method that it distinguish margin from nucleus where it is formally irrelevant. Neither Greenberg nor O'Connor-Trim accept

this refuge. Greenberg states that such segments should be treated as two phonemes for the purposes of his procedure (1972:77). O'Connor-Trim explore another possibility, that such segments will exhibit contexts in common with both vowels and consonants, and that they can then be separated into two segments with appropriate distributions. Unhappily, segments in double function do not always show this pattern, and furthermore they are not the only kinds of segments that may do so. For example, in a language with no initial vowels or initial marginal clusters and a preconsonantal syllabic n̩, the measure of O'Connor-Trim would group n unambiguously with the consonants, revealing nothing of its double function. (Even if the syllabic segment has a separate label, if the language had no marginal sequences and no utterances with nuclei consisting solely of n̩, Greenberg's recurrence intervals would give the same result. The maximum recurrence interval for vowels would be 2, e.g. #n̩CV-. Including n̩ with the vowels would reduce the maximum interval to 1, hence it is assigned to the consonants.)

If vowels occur initially (as in a number of Bantu languages) the O'Connor-Trim measure will show a double affinity for n. But then compare this to a case where instead of initial nC- sequences there were initial sequences of s+consonant, as in Alabaman (Rand 1968). In this case, s too would exhibit considerable commonality with vowels and consonants.

I think that it is fair to conclude that an explicit, non-phonetic, distributional characterization of vowel and consonant is not readily available, and that it can be no simple matter to achieve it. Before I turn to distributional theories of syllabification, let me remark that they are not unaffected by this conclusion. Syllable division is a matter of determining which marginal elements belong to which nuclei. A theory of

syllabification must necessarily presume that segments have already been classified as margin or nucleus, if only to be able to indicate that consecutive nuclei belong to different syllables. Of course, it is possible to uphold a hybrid distributional theory, granting that syllabicity has an independent or phonetic basis, but that syllable division is essentially distributional.[5]

3. Syllabification; the Word-terminal Condition.

The key to distributional theories of syllabification is a principle first exploited systematically by Kuryłowicz (1948): roughly, that initial and final clusters of medial syllables conform to the same constraints as those in initial and final syllables. Stated as an empirical generalization, we have the Word-terminal Condition:

(3) If an intersyllabic sequence is analyzable into permissible word-initial and word-final clusters, then the perceived boundary does not fall between nonpermissible clusters.

Compared to most sweeping statements about the syllable, the principle has astonishing generality. Even so, it does not appear to hold universally. It is not hard to imagine plausible counterexamples.

One would run like this. Consider first a language with no initial clusters and only open syllables finally. Say that it has medial consonant sequences of two segments, all heterosyllabic, with syllable division falling between the segments. Now say, perhaps by vowel loss, some of the medial clusters end up occurring in initial position as well. The Word-terminal Condition predicts that just these clusters will become tautosyllabic, but it seems plausible that they might retain their original syllabification. Indeed something of this sort appears to have occurred in Huichol, which has a few initial clusters, for example pt-, pk-, and mt-;

no final consonants; and medial consonant sequences which include the initial ones. McIntosh (1945) reports that all medial clusters are heterosyllabic, and Grimes' (1959) description is in essential agreement. Alabaman is another language where the same process has led to a violation of the Word-terminal Condition(Rand 1968).[6]

The Word-terminal Condition is not itself a basis for a theory of syllable division. It leads to definition of a syllable boundary only where the sequence of marginal segments between two syllables can be analyzed into a permissible final and initial clusters in just one way. English dogma is an example. Call these uniquely analytic[7] sequences. But there also occur multiply analytic sequences, such as English extra, which has three possible divisions that satisfy the Word-terminal Condition. And, more rarely, one finds unanalytic sequences, for which no division yields permissible final and initial clusters. Spanish transcripcion is a stock example, since -ns does not occur at the end of Spanish words, nor does scr- occur initially.

3.1 Principles of distributional syllabification.

It is possible to arrive at a formal definition by dividing the multiply analytic and unanalytic sequences uniformly and arbitrarily, for example, by assigning the entire sequence to the first syllable.[8] The distributional theories of syllabification of Kuryłowicz, Haugen, O'Connor-Trim, and Pulgram all seek principled, nonarbitrary procedures to divide these sequences. They differ mainly in how they go about it. In the following discussion I will concentrate on the basic principles that their procedures embody, rather than discuss each in detail. Table 2 should help keep track of the connection between principles and theories.

Table 2. Principles of Syllable Division.

	W-T Condition Dominant	Uniform Divisibility	Open Syllable	Minimal Coda	Irregular Coda
Kuryłowicz	–	–	+	–	+
Haugen	–	+	–	–	–
O'Connor-Trim	+	+	–	–	–
Pulgram	+	–	+	+	+

The first principle that I have listed, labeled 'Word-terminal Condition dominant', has to do with whether a uniquely analytic sequence must be divided into permissible final and initial clusters, or whether there are exceptions governed by some other principle. Kuryłowicz relaxes the application of the condition only in favor of the Open Syllable Principle, which states that

(4) A single intervocalic consonant belongs to the following syllable.

This, by the way, would lead to syllabifications in English such as Singapore ['sI.ŋəpor], hangar ['hæ.ŋr], gingham ['gI.ŋəm].[9]

3.2 The procedures of Haugen and O'Connor-Trim.

Now what does the next principle, 'Uniform Divisibility', mean? This concept postulates that

(5) Medial sequences of the same length are divided in the same way for a given language.

It is the cornerstone of the theories of Haugen and O'Connor-Trim. As a general tendency, there seems to be some support for it. One expects a single consonant to syllabify with the following vowel, two consonants to be separated by syllable division, and so on, with certain exceptions owing to the Word-terminal Condition or to the presence of grammatical boundaries. As a universal principle, however, it has undeniable weaknesses.

If applied to all medial sequences, as Haugen, at least if taken literally, proposes, it leads to such unacceptable conclusions as the identical

division of the 3-segment sequences in anxious ['æŋkʃəs] and obstacle ['abstəkl]. Even if uniquely analytic sequences are excepted, the principle does not appear to coincide with descriptions of some languages. Luganda has medial sequences of nasal+stop as well as geminate obstruents. Both of these are unanalytic, since final syllables are open, and in initial sequences of nasal+stop or stop+stop the first element is syllabic. Their syllabification differs: nasal+stop sequences form a tautosyllabic cluster with the following syllable, whereas geminates are divided (Tucker 1962, Cole 1967). And in general, it is not difficult to find cases where certain sequences are tautosyllabic, typically sequences of obstruent and liquid or fricative and stop, whereas others are heterosyllabic. Sometimes the deviant clusters are uniquely analytic, as in Yakur, a West African language (Bendor-Samuel 1969), but sometimes they are not, as in Cham of Southeast Asia (Blood 1967).

Further, when we measure the principle of Uniform Divisibility against its utility in explaining wider phonological phenomena in terms of the syllable, again it appears to be lacking. I cite a few examples. A general statement of the Romance stress rule in terms of the syllable requires that some obstruent-liquid sequences be tautosyllabic. James Hoard (1971) has posited different syllabifications for English words like Hittite and Mitty, the tenseness and aspiration of the medial t in Hittite being explained by its syllable-initial position, as opposed to the syllable-final t in Mitty. Similarly, Theo Vennemann (1972) has recently pointed out that vowel lengthening in Icelandic can be stated very generally as occurring in open syllables if certain obstruent-sonorant sequences are taken to be tautosyllabic. This is not just an unmotivated trick. The same syllabification functions in other phonological processes in Icelandic.

The principle of Uniform Divisibility implies that neither the nature of the segments themselves, nor the accentual context in which they occur, plays

a role in syllabification of medial sequences. The available evidence does not support this hypothesis.

3.3 The procedures of Kuryłowicz and Pulgram.

I turn now to the theories of Kuryłowicz and Pulgram. They do not differ greatly in their conceptual basis. For brevity's sake, I will treat only Pulgram's theory of syllable division, it being more recent.

Unanalytic sequences are resolved by the principle of the Irregular Coda:

(6) If all divisions of a sequence yield a nonpermissible initial or a nonpermissible final cluster, the nonpermissible cluster must be the coda.

Thus Spanish trans.cripcion. I do not know any cases of medial sequences where neither a permissible initial nor a permissible final cluster would result. Venneman (1972) has pointed out an exception to this principle: German ['rā.dlə] 'I bicycle' where *dl- is not a permissible initial cluster. However, the Northern variant ['rāt.lə] suggests that the principle may have diachronic application.

Pulgram resolves multiply analytic sequences by the principle of the Minimum Coda, which includes the principle of the Open Syllable:

(7) If a medial sequence can be analyzed into permissible final and initial clusters in more than one way, the syllabification yielding the shortest coda is chosen.

Like the others discussed previously, this principle has a certain validity. In Cham, for example, medial obstruent+sonorant clusters are tautosyllabic, even though the obstruents in question occur finally. The opposite situation, in which final, but not initial clusters occur, is found in the indigenous words of Karačay, a Turkic language. The medial sequences of two segments that also occur as final clusters could then, by the Word-terminal Condition, syllabify with the preceding syllable, but they don't. All medial sequences are heterosyllabic (Hebert 1962).

Yet one need not go far afield to discover difficulties. They exist in English. One quickly finds that the phonetic transcriptions of Kenyon and Knott do not always have divisions with minimal codas. Examples are historic [hIs'tɔrIk], vestigial [vɛs'tIdʒIəl], Estonia [ɛs'toniə]. Pulgram's actual procedure would in fact give this same syllabification. This is because in such cases, the preceding nucleus is a lax vowel which does not occur finally. Hence a division placing the entire cluster with the following syllable is not permitted. But this is no more successful vis-a-vis Kenyon and Knott. For there we also find cashier [kæ'ʃir], effete [ɛ'fit], effluvium [ɛ'fluvIəm], necropolis [nɛ'krapəlIs], plurality [plU'rælətI], and so forth.

If we ask what phonological generalizations beyond segmental distribution a syllable based on the principle of the Minimal Coda leads to, I know of none. However, it is no more compatible than the principle of Uniform Divisibility (5) with the general formulations concerning Romance stress, English aspiration and tenseness, and the Icelandic vowel length mentioned earlier. The reason is that the principle of the Minimal Coda, like that of Uniform Divisibility, maintains that medial sequences of consonants will syllabify in the same way -- no matter what the nature of their individual segments, no matter what their accentual context of occurrence. The distinction that the principle of the Minimal Coda does make, by which different divisions are possible for medial sequences that do not have the same possibilities of analysis into permissible final and initial clusters, does not appear to yield an explanatory advantage.

4. Conclusions.

I have two conclusions. First, the specific theories of the distributional syllable that have been proposed are unsuccessful. They are unsuccessful

because their implicit or explicit conceptual bases, (1) through (7), are stretched too far. They should not be adopted as a basis for language description, as has happened.[10] This practice is not harmless. It robs the linguistic community of whatever empirical observations about syllabic phenomena that might have been made.

Now one might grant that the present definitions of the distributional syllable are inadequate yet still maintain that the basic assumptions hold, their vindication awaiting only the discovery of the perfect formal definition of the syllable. To the contrary, my second conclusion is that the basic assumptions of the distributional syllable are unwarranted.

The problem of the syllable in phonological theory is the problem of the organization of segment strings. Segment strings exhibit strikingly regular patterns of organization, yet their possibilities of organization appear to be far too complex to be accounted for by constructs based on a few selected near-universal regularities of distribution, such as (1)-(7) discussed above. This means that it is unlikely that the syllable is a unit derivative from abstract phonological features, just as at the phonetic level it has not been possible to derive it from phonetic features. That the other basic assumption of the distributional syllable, abstraction from phonetic realization, is untenable, is shown by the nature of the failures of the theories. Their rectification does not seem possible to me unless some relationship with phonetic form is admitted.

I do not conclude that phonology can do without the syllable. For the concept of the syllable to contribute to phonology, it should be promising to assume, just as we assume that speech is organized into segments, that segments are organized into syllables, both phonetically and at more abstract levels. We should, however, guard against too narrow a view, against confusing a tool with the problem. 'Defining the syllable' and 'proving the

existence of the syllable' are probably psuedo-problems. The problem is segment organization. If an independent, phonetically related theory of the syllable can explain its regularities, so much the better. If not, we will be awaiting a more general theory of organization, and the syllable may enter the museum's Hall of Scientific Constructs, taking its place beside ether, the noble savage, and the like.

NOTES

1. This is a revised version of a paper read at the annual meeting of the Linguistic Society of America, December 29, 1971.

2. I have omitted works devoted mainly to specific languages, e.g., Holt (1949) and Baldwin (1969). The reader should realize that the works considered herein are part of a particular tradition in linguistics, and within that context represent a considerable achievement. Indeed, the ideas they embody still possess a considerable influence independently of the tradition. It is a tribute that they stimulate explicit opposition at this date.

3. For those who might wonder whether statistics based on token rather than type occurrences would be more successful, I can report that a preliminary attempt to apply this approach to English showed no promise whatsoever (Bell 1966).

4. At least under the usual assumption that nuclei contain but a single syllabic segment.

5. This is the conclusion of Kloster Jensen (1963).

6. The Alabaman clusters that occur initially are /st, sk, sw, sL/, which makes less tenable the explanation that the violation of the Word-terminal Condition is due to the inherent heterosyllabicity of segment sequences in question. Whether violation could occur with sequences of say, stop+liquid is open.

7. The terms in 'analytic' refer to properties of marginal sequences. I think it is worth distinguishing them from those in 'divisible' on one hand and 'resolvible' on the other. My practice is to reserve 'divisible' for perceptual judgments (Bell 1970:40). Resolvibility, like analyticity, is a purely formal property and refers to the inclusion of shorter occurring or permissible sequences within longer ones. The notion is exploited by Greenberg (1965), who attributes the original concept to Hjemslev. The difference is that for resolvibility, the sequences in question occur in the same position (initial cluster including initial cluster, medial including medial, final including final); whereas analyticity is restricted to medial sequences and pertains to their inclusion of terminal clusters.

8. Koefoed (1967:177) uses this example, pointing out that it was actually adopted by Bjerrum (1944).

9. These and the following phonetic transcriptions of English words are taken from Kenyon and Knott (1953).

10. For example, McArthur and McArthur (1956) for Aguacatec, Sommer (1968, 1970) for the Kunjen dialects of Australia. I suggest that Sommer's theoretical orientation led him to claim that all medial margin sequences formed the coda of the preceding syllable, so that there were no syllables with onsets. Any discussion of other evidence for syllable division was omitted. Such evidence does exist, not supporting his unlikely conclusion (Dixon 1970).

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SOME ARAGONESE MORPHOPHONEMICS

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ABSTRACT

The stress patterns of Aragonese are examined within the framework of generative phonology, based on data taken from the traditional works of Haensch, Badía Margarit, and Alvar Lopez. Stress placement is shown to be regular. Two sets of rules which account for the data are compared. In the preferred solution, a penultimate stress rule, a rule of stress shift, and other independently motivated rules account for the various stress patterns in Aragonese. Dialectical differences in stress placement are shown to result from rule reordering.

0. Word stress patterns have been studied very little in Aragonese.[2] The present study can only hope to be exploratory at most since little prior research has been done. Nevertheless, the results of this research generally should provide a firm basis for future and more comprehensive work.

The purpose of this study will be to establish that stress in Aragonese is a completely predictable phenomenon. This will be shown by postulating a stress rule that will, along with functionally related rules and proper base forms, account for the various stress patterns of Aragonese. In addition, it will be shown that those differences in stress that do exist between dialects in Aragonese are apparent only and attributable to the "functionally related rules."[3]

1. Consider the following list which exhibits the numerically dominant word stress pattern of substantives in Aragonese.[4]

Chart Ia[5]

ĉíβa	'hunchback'
trípa	'entrails'
bárβa	'chin'
barríλa	'jaw'
kanyéλa	'wrist'
pyérna	'thigh'
béna	'esophagus'
kára	'face'
kása	'house'
kaβésa	'head'
entráóa	'vestibule'
fórka	'fork'
kwaránta	'forty'
féβre	'fever'
λáóre	'thieving'
kwátre	'four
ĉeláγra	'furze'
asúkre	'sugar'
bináγre	'vinegar'
kaβéstre	'butt'
amórro	'row'

múskʌo	'shoulder'
bráso	'arm'
díδo	'finger'
melíγo	'navel'
galíʌo	'Adam's apple'
barránko	'gully'
fílo	'thread'
seδáso	'sieve'
taβáno	'horsefly'
paníso	'corn'
déδo	'finger'
melíko	'navel'
paníθo	'corn'
estomáγo	'stomach'
musíka	'music'
molomáγa	'type of plant'
caδyéra	'bench'
kantáro	'pitcher'
etc.	

Verbs also exhibit this pattern.

Chart Ib

tóryo	'I twist'
twérsko	'I twist'
párte	'He divides'
sáka	'He takes out'
etc.	

As can be seen from the above lists of lexemes the predominant word stress pattern in Aragonese is penultimate. The following rule would account for this pattern.

(1) Main Stress Rule

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; ____ \; C_o \; V\#^6$$

(where "C" is equal to the feature complex [-Syllabic] and "V" is [+Syllabic])

There is a fairly large group of lexemes, however, which exhibit ultimate stress.

Chart IIa

señál	'sign'
kapón	'capon'
baθyól	'drinking trough'
biɣós	'farming instrument'
braɣér	'joint of the udder of a cow'
brikét	'lighter'
burlonót	'joking'
kahíe	'nominal measure of twelve bushels'
kalór	'heat'
etc.	

This pattern is also found in verb forms.

Chart IIb

responém	'We respond'
kayér	'to fall'
kuʎír	'to gather'
arriér	'to laugh'
kantár	'to sing'
etc.	

To account for the above stress pattern one might propose that rule (1) be revised to (2).

(2) [+Syllabic] → [+Stress] / ____ C_1 (V)#

Notice that (2) breaks down into two subrules which are disjunctively ordered. This is displayed in (3) which is a graphic illustration of (2).

(3) [+Syllabic] → [+Stress] / ____ $\left\{\begin{matrix} C_1 \quad V\ \#\quad 1) \\ C_1 \quad \#\quad\ \ 2) \end{matrix}\right\}$

Condition: If number one applies, then two does not apply (disjunctive condition).

Subrule one then accounts for the lexemes of which the ones in Chart I are representative, and subrule two accounts for the lexemes of which the ones in Chart II are exemplary. However, by looking a little further we will see that (2) will not do.

Chart III

enimíɣos	'enemies'
kaðyéras	'benches'
meðíkos	'doctors'
makínas	'machines'
etc.	

By rule (2) these forms would be improperly accented as "'enimiɣós, 'kaðierás, 'meðikós" etc. Obviously another solution must be found because this will not do. We might propose that rule (2) be revised to that of (4).

$$(4) \quad [+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; ____ \; C_1 \; (V \; (([+\text{CNS}]_{\{+\text{Plural}\}})) \; \#$$

(4) has three subrules which are disjunctively ordered. These are illustrated in (5).

$$(5) \quad [+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; ____ \begin{cases} C_1 \; V \; [+\text{CNS}]_{\{+\text{Plural}\}} \; \# & 1) \\ C_1 \; V \; \# & 2) \\ C_1 \; \# & 3) \end{cases}$$

Condition: One through three are disjunctively ordered.

Once again a revised but much more complex rule accounts for the data. Subrule one will properly stress the lexemes of Chart III and the group they represent. Subrules two and three will respectively account for Charts I and II. However, once again the addition of new data defies our stress rule because there is a group of lexemes in Aragonese that end in consonants, take penultimate stress, and are not necessarily plurals.

Chart IV

myérθes	'Wednesday'
byérnes	'Friday'
tirapyéðras	'door knob'
ánĉel	'angel'
oréβal	'type of shrub'
árβol	'tree'
núβel	'storm cloud'
barrílas	'jaw'
mokáðor	'handkerchief'[7]
etc.	

Subrule three of (5) would improperly stress "myerθes, anĉel, mokaóor" etc. as "myerθés, anĉél, mocadór" etc. Since these words are not plural, subrule one is inapplicable. Two is also inapplicable since they do not end in vowels. This leaves three which applies as it did in the cases of Chart II. However, these words have penultimate stress and not ultimate stress like the ones of Chart II. Notice that we cannot further elaborate rule (4), the stress rule, as was done in previous cases to handle the lexemes of Chart IV because they are canonically and grammatically identical to the lexemes of Chart II. Chart IV then constitutes as empirical falsification of rule (4). One solution to the problem would be to mark all the lexemes of which the ones of Chart IV are exemplary with an exception feature. Then rule (4) would be inapplicable to this set of lexemes. Another rule would then stress them properly (or alternatively they would be marked for stress in the base forms). Using an exception feature, however, would have the effect of creating a relatively large class of lexemes which for no other reason other than stress would be classed together. This does not come without cost because any arbitrary classification within a transformational grammar is costly under the simplicity metric and this is an example of arbitrary classification since it is only needed for one reason. In addition to this, if the exception feature is used the addition of another rule is needed and this constitutes further complication in the grammar. Obviously a proposal of this type[8] must be put aside until all possible phonological and grammatical ones have been studied and appraised.

Consider the lexemes of Chart I once again. To be observed is the fact that of the three vowels which occur in word final position in Aragonese ([e], [o], [a]) the front mid vowel has a limited distribution in that position. The only environment in which we find the front mid vowel is the one that follows consonant clusters, i.e. VCC ___ as in the words [féßre, λáóre, kuátre, bináγre], etc. The mid vowel [e] is then lacking from the final environment which follows single consonants, i.e. VC ___#. Turning our attention now to Chart II where ultimate stress is displayed, we find that these words all end in a consonant that is immediately preceded by a vowel, i.e. VC#. This environment is then identical to the one in which we found "e" missing in Chart I, i.e. VC ___#. The fact of the matter is that if [e] were found in this environment it would be equal in distribution in final position to that of [o] and [a]. Also notice that if [e] were

found in this environment in the lexemes of Chart II they would have penultimate stress and not ultimate. The above observations seem to lead to the conclusion that there is an [e] in word final position in the lexemes of Chart II in the derivation at the time of stress which is deleted before the final phonetic form is derived. The presence of the [e] along with a vowel apocopation rule could explain on the one hand the ultimate stress pattern of the lexemes of Chart II and on the other hand the limited distribution of [e] in word final position. In addition to this it simplifies the stress rule to the form (6).

(6) [+Syllabic] → [+Stress] / _____ (C_oV) $C_o\#$

(the second subrule will accent monosyllabic forms)

(6) will account for all the stress patterns exemplified in Charts I-IV if an [e] is present at the time of stress in the derivation in final position in the lexemes of Chart II. One way an [e] could be put into the derivation would be by a vowel epenthesis rule which would place the front mid vowel after word final VC sequences.

(7) Epenthesis Rule

Ø → e / VC _____ #

This rule would be ordered before (6), the stress rule, which would be followed by the vowel apocopation rule. Example one would be a sample derivation for this solution.

Example #1

/señal/	Underlying Form
|señale|	(7) Epenthesis Rule
|señále|	(6) Main Stress Rule
|señál|	Vowel Apocope
[señál]	Final Phonetic Form

This solution, however, has two defects. To begin with, while it accounts for stress, it does not account for the aberrent distribution of [e] in final position since [e] was epenthesized and not there to begin with. Secondly and more crucially, rule "b" will epenthesize [e] also after the final VC sequences of the lexemes of Chart IV. A lexeme from Chart IV would have a derivation like the following.

Example #2

/mokador/	Underlying Form
|mokadore|	(7) Epenthesis Rule
|mokadóre|	(6) Stress Rule
|mokadór|	Vowel Apocope
	(Other rules)
*[mokaðór]	Final Phonetic Form

Notice that the output of this derivation is an ungrammatical sequence because it is stressed improperly. Rule (7) cannot be made to distinguish between the lexemes of Chart II and the ones of Chart IV since they are phonologically, morphologically, and grammatically alike; therefore, it will create an ungrammatical sequence each time an underlying form for a lexeme of the type of Chart IV serves as an input. Once again exception features could be used to set off the lexemes of Chart IV; however, we reject them here for the same reasons stated above. Rule (7) is then rejected as a possible solution for this problem. Another possible solution is to assume that the front mid vowel is in the underlying form to begin with; that is, it is part of the underlying forms for the lexemes of Chart II but not part of the underlying forms for the lexemes of Chart IV. This solution like the first one would require a vowel apocopation rule which would delete these final front mid vowels when they followed a VC sequence. The following is a tentative approximation.

(8) Apocope Rule

$$\begin{bmatrix} +\text{Syllabic} \\ -\text{Back} \\ -\text{Low} \end{bmatrix} \rightarrow \quad \emptyset \;/\; VC ____ \#$$

A sample derivation for two lexemes one from Chart II and the other from IV would look like the following.

Example #3

/kalore/ (form II)	/mokador/ (form IV)	Underlying Form
|kalóre|	|mokádor|	(6) Stress Rule
|kalór|	NA (nonapplicable)	(8) Vowel Apocope
		(Other rules)
[kalór]	[mokáðor]	Final Phonetic Form

This solution has the effect of explaining why some lexemes (the ones in Chart II as opposed to those of IV) which look alike canonically differ in stress phonetically. The explanation is in the fact that they differ in their underlying forms; that is, the ones of Chart II end in vowels and the ones of Chart IV, in consonants. This postulation besides accounting for apparent stress irregularities also explains the limited occurrence of [e] in final position; that is, [e] has the same distribution as [a] and [o] in the underlying forms, but undergoes an apocopation rule which deletes it from VC ____ # environments.

To sum up then, to account for the lexemes of Charts I-IV we have had to postulate final front mid vowels for the lexemes of Chart II, a penultimate stress rule, and a vowel apocopation rule. Therefore, we may think in terms of two rules so far: 1) a penultimate main stress rule and 2) a vowel apocope rule.[9]

The above hypothesis of final vowel postulation, will not account for all the irregularity of stress in Aragonese because there exists an additional group of lexemes which exhibit either antepenultimate or ultimate stress where final vowel postulation will not explain the stress irregularity.

Chart Va

sofráina	'curved'
káiša	'coffin'
bóira	'generic name of cloud'
maδéiša	'skein'
λéuta	'yeast'
táula	'board'
borráina	'borage'
fléišin	'ash tree'
baráiša	'pack of cards'
pyáina	'stand'
λešyú	'washing'
etc.	

The above list is representative of substantives with this type of stress pattern. Chart Vb shows participles from dialects C and E which exhibit it also.

Chart Vb

rompyú	'broken'
suβyú	'known'
sentyú	'felt'
benyú	'come'
kisyú	'wanted'
káito	'fallen'
etc.	

Chart Vc shows this same pattern occuring in verb conjugations.

Chart Vc

aβryés	'You opened'
aβryó	'He opened'
salyés	'You left'
salyón	'They left'
bendyé	'I sold'
bendyés	'You sold'
bendyó	'He sold'
káiβa	'I was falling'
tráiβa	'I was bringing'
etc.	

The question is this: do these words constitute true exceptions to the penultimate stress rule or are they only apparent exceptions. If the former is true then rule (6), the penultimate stress rule, is inadequate in its present form since it obviously will not handle the lexemes of V. To account for the above stress pattern as well as what we have accounted for so far, we propose the following reformulation of (6).

(9) [+Syllabic] → [+Stress] / ____ ((V) [+Consonant]$_1$ V) C_o#

This rule can be expanded into three disjunctively ordered subrules which are displayed in (10).

(10) [+Syllabic] → [+Stress] / ____ $\left\{\begin{array}{ll} V\ [+Consonant]_1 VC_o\# & 1) \\ [+Consonant]_1 VC_o\# & 2) \\ C_o\# & 3) \end{array}\right\}$

Condition: One through three are disjunctively ordered.

Rule (9) along with the vowel postulations we have made will account for the stress patterns of Charts I-V in the following manner.

Example #4

Chart I	Chart II	Chart IV	Chart V	Chart V	
/ĉiba/	/kalore/	/mokador/	/benyu/	/kaitu/	Tentative Underlying Forms
(subrule 2)	(subrule 2)	(subrule 2)	(subrule 3)	(subrule 1)	Stress (9)
ˈĉíba˧	˧kalóre˧	˧mokádor˧	˧benyú˧	˧káitu˧	
NA	˧kalór˧	NA	NA	NA	Apocope (8)
					(other rules)
[ĉíba]	[kalór]	[mokáðor]	[benyú]	[káitu]	Phonetic Forms

It appears then that (9) will handle the above exceptions to (6). However, looking further we find lexemes like the following.

Chart VIa

piλáu	'plundered'
kantáu	'surg'
payáu	'paid'
treβaλáu	'worked'
tornáu	'returned'
aleráu	'stupified'
fresáu	'frezar'
etc.	

Rule (9) will improperly accent the above past participles respectively as "ˈpiλaú, ˈkantaú, ˈpayaú," etc. Notice that these forms are grammatically parallel to the ones of Chart Vb in that both sets are masculine past participles. However, the participles of Chart VIa differ from those of Chart Vb in that the first vowel of a hiatus is stressed in the former and in the latter it is a final vowel which is the second member of a diphthong which is stressed. At first sight one might propose the following revision of rule (9) to handle the new data.

(11) $[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; \underline{\quad} \; (((V)[+\text{Consonant}]_1)V)C_o\#$

The adequacy of this rule, however, is only apparent. Notice that in order for forms like [benyú] to be stressed correctly by rule (9) the glide has to block subrule two of (10). Since the glide [y] is [-Consonant] it will be excluded from being part of the consonant cluster. Therefore words with a final diphthong will not fit the structural description of subrule two (also one) which means that forms of this type will be stressed by subrule three which places stress on the final vowel. If this were the situation in all cases, that is, if all final diphthongs were stressed, then rule (11) would be acceptable; however, this is not the situation. Forms like [θékya, alúßya, alßertéηθya, xólyo], etc. suggest that glides should be considered as part of the consonant clusters since the penultimate vowel is stressed (they undergo subrule two) and not the ultimate vowel which is part of the diphthong. Since we cannot both choose to allow and not to allow the glide to be part of the consonant cluster we must make a decision between the two choices. Not allowing glides to be part of consonant clusters according to our stress rule is tantamount to the claim that the glides of all final diphthongs take part in stress, but this is obviously not true since some clearly do not. It seems more reasonable to allow glides to be part of consonant clusters (permitting forms like [θékya] to be stressed by subrule two) and to claim underlying sylabicity for those glides which have apparently taken part in stress (thus still blocking subrule two from applying to the forms of charts Vb and c). To begin with, we must allow the 'consonant cluster' in question to include all nonsyllabics, not just those marked [+Consonant]. This is achieved by specifying it as [-Syllabic] instead of [+Consonant], i.e., it will now appear in the rule as $[-\text{Syllabic}]_1$ $(=C_1)$. Secondly, we must alter the input to the stress rule of forms like [benyú] in order that they not be penultimately stressed. The fact that these glides do take part in stress appears to be an indication that there is a history of syllabicity in their derivation; that is, they are vowels at the time stress applies. That this is the case is further substantiated by the additional fact that the glides which are in the final stressed diphthongs of the forms of Charts Vb and c are the phonetic realizations of ehat are traditionally considered to be the stem vowels of verbs. Consider the following forms in Chart VIb.

Chart VIb

benyú	'come' (participle)
byénes	'You come'
byéne	'He comes'
byénen	'They come'
benímos	'We come'
benío	'You (pl) come'

Where the underlined segment is the stem vowel.

(The last five forms are representative of all the verbs with respect to the syllabicity of the stem vowel.) Notice that the stem vowel is syllabic in all but the first form and has taken part in stress placement in each case. The last two forms in particular provide strong evidence in that they have actually received stress. This is then evidence for underlying syllabicity for the segments traditionally referred to as stem vowels since nonsyllabics do not take part in stress placement. This is once again shown by forms such as [θékya, alúßya, alßerténθya, matrimónyo, endámyo], etc. where the glides are simply acting as part of the consonant clusters. Under any other interpretation there would be a great deal of complication. We then assume for the reasons stated above that segments usually referred to as stem vowels are syllabic in their underlying forms and later, after stress, are glided in certain environments. Note that the forms of Charts Vb and c plus the true glide forms, i.e.[θékya] are stressed properly by (9) now because, on the one hand, we respecified its internal 'consonant cluster' to include all nonsyllabics and, on the other hand, we assumed that all stem vowels were syllabic at the time of stress (thus the stem vowel, being [+Syllabic] at the time of stress, will block the application of subrule two of (10) as the glide did before). However, we still have not accounted for the stress of the forms in Chart VIa. One possible solution to this problem involves recognizing verb classes which have traditionally been referred to as conjugational classes. To begin with notice that the stems of the participles of Chart VIa have a different stem vowel than the ones of Chart Vb and c. We could set up a revised form of (9) which would stress the masculine participles of the "a" conjugation class (Chart VIa) differently than the rest of the masculine participles.

This seems to be very arbitrary, however, since the members of the "a" conjugation class differ in no other way with regards to stress from the other verbs. Therefore this would be placing a special restriction on the stress rule which would be applicable only for a small set of verb forms. The above involves a solution which is partially grammatical and phonological. There is, however, a purely phonological solution which will properly stress all the lexemes considered up to now. Keeping in mind that the first vowel of the hiatus was stressed if it was [a], otherwise the second vowel was stressed, consider rule (12). (Keep in mind that we are speaking of underlying hiatuses. Their phonetic reflexes may or may not be hiatuses.)

(12)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \left[\frac{\quad}{\langle +\text{Low} \rangle} \right] \left\{ \begin{array}{ll} (V)\ C_1 V C_o \# & 1) \\ \langle V \rangle \quad C_o \# & 2) \end{array} \right\}$$

(See Harms 1968 for explanation of angled brackets.)

Rule (12) can be expanded into (13).

(13)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \left\{ \begin{array}{ll} \multicolumn{2}{l}{\quad\quad\quad

However, by looking at more data we find that this rule is still inadequate in its present form. For example, consider the following data.

Chart VIIa

trayéis	'You bring (pl)'
beyéis	'You see (pl)'
séis	'You are (pl)'
kantéis	'You sang (pl)'
riθyóres	'You laughed'
saβyóres	'You knew'
salyóres	'You left'
partyémos	'We divided'
salyémos	'We left'
metyémos	'We put'

To begin with the latter six forms will require us to reformulate (12) because as it is formulated now it will improperly stress "ri iores, sa iores, saliores" etc. respectively as [ri íores, sa íores, salíores] etc. Secondly the first four forms will require a modificaiton of subrule three since "e" is not low. The latter is a minor modification; however, the former is not. Consider (14) as an initial approximation to this rule.

(14)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \;/\; \left\{ \begin{array}{ll} V \left[\frac{\quad}{-\text{High}}\right] C_1 V\, C_o\# & 1) \\ \left[\frac{\quad}{\langle -\text{High}\rangle}\right] \begin{array}{l} (V)\, C_1 V C_o\# \\ \langle V\rangle\, C_o\# \end{array} & 2) \end{array} \right\}$$

Condition: Subrules one and two are disjunctively ordered.

Rule (14) is very complicated though, in fact so complicated as to make one suspicious of it. Notice that we have disjunctively ordered subrules "one" and "two" with brace notation. However, good evidence has been presented by Chomsky and Halle showing that brace notation should only be used to conjunctively order rules and that parenthesis notation should be used to disjunctively order rules. That is, "two successive rules of the grammar are disjunctively ordered . . . if they can be jointly abbreviated by a schema involving parentheses . . .[if] they can

be abbreviated by the brace notation . . . they are conjunctively ordered." (Chomsky 1967:121) Accepting their conclusions as valid and it appears they are, then, we have improperly used the brace notation. That is, we have disjunctively ordered brace notation by the use of an ad hoc condition which stated that it was disjunctive in this particular setting. (14) is, then, an impossible rule within the theoretical model we are working since brace notation is ruled out as a possible abbreviatory device for disjunctive ordering. At this point it might be asked if (14) is revisable in terms of parenthesis notation. If it is not we must then sharply change our approach to the problem. To begin with, notice that in subrule "two" of (14) we have properly used brace notation; that is, its subrules are conjunctively ordered. However, observe that it can be made wholly disjunctive with the use of parenthesis notation. In addition to the above principles concerning conjunctive and disjunctive ordering, Chomsky and Halle have presented sound evidence for a principle which states that disjunctive ordering by the use of parenthesis notation and an extension of it, angled brace notation, should be maximally utilized in the grammar; that is, "abbreviatory notations must be selected in such a way as to maximize disjunctive ordering". (Chomsky and Halle 1968:63) In accordance with this principle we must prefer, then, the disjunctively ordered rule over the conjunctively ordered one. With this in mind, we propose (15) as the corresponding disjunctively ordered rule to (14).

(15)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \;/\; \begin{cases} V \left[\overline{-\text{High}}\right] \; C_1 \; V \; C_o\# & 1) \\ \left[\overline{\langle -\text{High} \rangle}\right] \langle V \rangle \; (C_1 V) \; C_o\# & 2) \end{cases}$$

Condition: Subrules one and two are disjunctively ordered.

Though this rule is an improvement over (14), it still violates the principles of transformational grammar; however, as should be obvious by now, subrule "two" can be ordered before subrule "one" and if it is, "one" becomes vacuous since "two" in its disjunctive formulation will handle all the stress patterns properly. With this being the case, subrule "one" is deleted from (15) giving us (16), a rule which is wholly disjunctive and completely in accordance with the principles of transformational grammar.

(16) $[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; \left[\overline{\langle -\text{High} \rangle}\right] \; \langle V \rangle \; (C_1 V) \; C_o \; \#$

(16) can be expanded into (17).

(17) $[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; \left\{ \begin{array}{lll} \left[\overline{-\text{High}}\right] & V \; C_1 \; V \; C_o \; \# & 1) \\ \left[\overline{-\text{High}}\right] & V \; C_o \; \# & 2) \\ \underline{\quad\quad} & C_1 \; V \; C_o \; \# & 3) \\ \underline{\quad\quad} & C_o \; \# & 4) \end{array} \right\}$

Condition: One through four are disjunctively ordered.

This disjunctive rule, however, is more general than (14) because it claims that the first vowel of any hiatus will be nonhigh if it is stressed. (14) on the other hand only claimed this for ultimate hiatuses. That the former is the case is shown by the following forms:

Chart VIIb

bóira	'generic name of cloud'
maðéiša	'skein'
ɣéuta	'yeast'
θéika	'irrigation ditch'
fléišin	'ash tree'
léiβa	'I was reading'

This solution then seems to lend some credence to the claim that disjunctive ordering must be utilized to the maximal extent.

Consider now the following forms.

Chart VIIc

rekúina	'pantry'
múito	'much'
búišo	'box'
frúita	'fruit'
búitre	'vulture'
búina	'cow dung'
brúiša	'witch'

The above forms would be stressed improperly by our stress rule. That is, "muito, buĩso, fruita" would be stressed respectively as *[muíto, buíĩso, fruíta]. The reason for this improper stressing is because our role will not stress the first vowel of a hiatus unless it is nonhigh which of course [u] is not. To remedy this we propose (18).

(18)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \left[< \left\{ \begin{matrix} \overline{+\text{Back}} \\ -\text{High} \end{matrix} \right\} > \right] _ V \; (C_1 V) \; C_o \; \#$$

(18) states that the first vowel of a hiatus is stressed if it is either [+Back] or [-High]. Under this formulation then the above forms will be stressed properly.

By now it should be becoming obvious that there is more going on here than (16) is stating. That this is true is pointed up by the following forms.

Chart VIId

ĉoán	'proper name'
toáʎa	'tovalla'
bomboneá	'to buzz'
esplοβisñoñeá	'to drizzle'
raskleár	'to work with pearls'
trakeár	'to throb, beat with regard to the heart' (palpitate)

Notice that in each case the stress rule as now formulated would stress the first vowel of each hiatus since in every form they are nonhigh and in some of them they are even back. (18) must then be reformulated to (19).

(19)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \left[< \left\{ \begin{matrix} \overline{+\text{Back}} \\ -\text{High} \end{matrix} \right\} > \right] < \left[\begin{matrix} +\text{Syllabic} \\ \\ -\text{Low} \end{matrix} \right] > \; (C_1 V) \; C_o \#$$

That is, we must know not only some of the point features of the first vowel but also some of the second. (19) states that in order for the first vowel of a hiatus to be stressed, the second vowel must be nonlow and the first either back or nonhigh. It can be expanded as follows.

(20)

$$[+\text{Syllabic}] \rightarrow [+\text{Stress}] \;/\; \begin{cases} \left[\frac{\quad}{+\text{Back}}\right] \left[\begin{matrix}+\text{Syllabic}\\-\text{Low}\end{matrix}\right] C_1V\ C_o\#\ \text{a} & 1) \\ \left[\frac{\quad}{-\text{High}}\right] \left[\begin{matrix}+\text{Syllabic}\\-\text{Low}\end{matrix}\right] C_1V\ C_o\#\ \text{b} & \\ \left[\frac{\quad}{+\text{Back}}\right] \left[\begin{matrix}+\text{Syllabic}\\-\text{Low}\end{matrix}\right] C_o\#\ \text{a} & 2) \\ \left[\frac{\quad}{-\text{High}}\right] \left[\begin{matrix}+\text{Syllabic}\\-\text{Low}\end{matrix}\right] C_c\#\ \text{b} & \\ \underline{\quad} \; C_1V\ C_o & 3) \\ \underline{\quad} \; C_o & 4) \end{cases}$$

Rules one through four are disjunctively ordered while the "a" and "b" subparts of subrules one and two are conjunctively ordered, with respect to each other.

We illustrate rule (19) in example #6.

Example #6.

/kantua/	/kanteis/	/metiemos/	/muito/	/raskleare/	Underlying Forms
(by 2a	(by 2a)	(by 3)	(by 1a)	(by 3)	Main Stress Rule
¦kantáu¦	¦kantéis¦	¦metiémos¦	¦múito¦	¦raskleáre¦	A-12II
NA	NA	NA	NA	¦raskleár¦	Apocope C (other rules)
[kantáu]	[kantéis]	[metyémos]	[múito]	[raskleár]	Final Phonetic Form

It appears as if rule (19) accounts for the data, however, as it might have been observed already, this is not quite the case because of forms like the third one in example #6, [metyémos]. To put this in perspective, let us consider the following preterite constructions which are representative of various verb paradigms in the control dialects (forms similar to these can be found in the western dialects, but not in the eastern dialects which lack a preterite tense; however the latter in no way invalidates the conclusions which will be reached here.

Chart VIIIa

metyé	'I put'
metyóres	'You put'
metyó	'He put'
metyémos	'We put'
metyéθ	'You put (plural)'

metyóren	'They put'
koθyé	'I cooked'
koθyóres	'You cooked'
koθyó	'He cooked'
koθyémos	'We cooked'
koθyéθ	'You cooked (plural)'
koθyóren	'They cooked'
poδyé	'I was able'
poδóres	'You were able'
poδyó	'He was able'
poδyémos	'We were able'
poδyéθ	'You were able (plural)'
poδyóren	'They were able'

The stem vowels which are phonetically realized as glides in the above forms earlier were shown to be syllabic in their underlying representation. Furthermore, it was assumed without justification that they were high front unrounded vowels (i.e. the vowel /i/); however, this is not the case. In fact, we will have to consider them /e/ in their underlying representation because of their corresponding indicative forms.

Chart VIIIb

métes	'You put'
méte	'He puts'
metémos	'We put'
metéθ	'You put (plural)'
méten	'They put'
kwéθes	'You cook'
kwéθe	'He cooks'
koθémos	'We cook'
koθéθ	'You cook (plural)'
kwéθen	'They cook'
pwéδes	'You are able'
pwéde	'He is able'
poδémos	'We are able'
poδéθ	'You are able (plural)'
pwéδen	'They are able'

In the above forms [e] is the phonetic realization for the stem vowel of the same verbs shown in Chart VIIIa. If the above were the only pertinent data, then we would have an arbitrary choice between either "i" or "e" as the underlying representation of the stem vowel. However, that "e" must be chosen is shown by the following additional data where we do have [e]'s being derived from stem vowels which have as their underlying representation /i/.

Chart IXa

pártes	'You divide'
párte	'He divides'
partímos	'We divide'
partíθ	'You divide (plural)'
párten	'They divide'
partíβe	'I was dividing'
partíβas	'You were dividing'
partíβa	'He was dividing'
dwérmes	'You sleep'
dwérme	'He sleeps'
dormímos	'We sleep'
dormíθ	'You sleep (plural)'
dwérmen	'They sleep'
dormíβe	'I was sleeping'
dormíβas	'You were sleeping'
dormíβa	'He was sleeping'

There is an obvious morphophonemic alternation in the above chart between [i] and [e] as the phonetic realization of the stem vowel which is predictable in terms of stress, that is, [i] is realized when stress is present and [e] when it is not. If we assume that [i] is the correct underlying representation, then the following simple rule will account for this morphophonemic alternation.

(21) Vowel Lowering

$$\begin{bmatrix} +\text{Syllabic} \\ -\text{Back} \end{bmatrix} \rightarrow [-\text{High}] \; / \; \begin{bmatrix} _____ \\ -\text{Stress} \end{bmatrix}$$

If /i/ is the correct underlying representation of the stem vowel for the forms of Chart IXa, then we will have to consider the stem vowels of Charts VIIIa and VIIIb as being /e/ in their underlying representations since they do not alternate with respect to stress as the above forms do. Notice that we cannot consider the stem vowels of Chart IXa to be /e/ and derive /i/ from it when under stress because this would force us into representing the stem vowels of Charts VIIIa and VIIIb as /i/ which would result in circularity. For example, the above solution would involve at least two rules, one which would raise [e]'s to [i]'s under stress (partémos → partímos) and one which would lower [i]'s to [e]'s when not followed by a vowel (kwéθi → kwéθe). If we order the first rule before the second, we get ungrammatical derivations like the following: |partémos| → |partímos| → *[partémos]. On the other hand, if we consider the second rule ordered before the first, we still get ungrammatical derivations: |koθímos| → |koθémos| →*[koθímos]. It would require simultaneous application for the above two rules to apply properly in the grammar. However, simultaneous application for rules such as those above has been rejected by generative phonologists on various occasions, i.e. Chomsky and Halle 1968, Postal 1968. They have shown rather conclusively that it leads to great complication in the grammar and, in addition, results in "no significant generalizations". With simultaneous application not a possibility we are left with our first proposal to work out, which is, that the stem vowels of Charts VIIIa and VIIIb are represented morphophonemically as /e/ and the ones of Chart IXa as /i/. We have already accounted for the morphonemic alternation in Chart IXa; however, we must still acount for forms of the first three verbs like [metyé, metyó, koθyé, koθyó, poδyé, poδyó], etc. which we have concluded would be represented in their underlying representations respectively as /mete + e, mete + o, koθe + e, koθe + o, pode + e, pode + o/, etc. Notice that rule (19) will stress these forms improperly; that is, it will stress the first vowel because the second vowel of the hiatus is nonlow and the first is nonhigh. To correct this situation we need a rule which will raise /e/ to |i| in certain syllabic environments before the main stress rule applies. To begin with /e/ cannot be raised before /i/ because of forms like [fléĭsin]. It also cannot be raised before /u/ because of forms like [λéuta]. Finally, forms like [raskleár] show that it is not raised before /a/. However, it does raise before midvowels which is shown respectively for both /e/ and /o/ by [koθyé] and [koθyó]. A rule which would emcompass the above facts is (22).

(22) Vowel Raising

$$\begin{bmatrix} +\text{Syllabic} \\ -\text{Back} \end{bmatrix} \rightarrow [+\text{High}] \; / \; \underline{\quad} \; \begin{bmatrix} +\text{Syllabic} \\ -\text{High} \\ -\text{Low} \end{bmatrix}$$

If this rule is linearly ordered before (19) then stress would be correctly assigned since "i" is neither nonhigh or back. In addition to this rule, however, we need a rule to glide high vowels which are the output of it plus vowels from other sources.

Chart IXb

partyé	/parti + e/	'I divided'
partyóres	/parti + ores/	'You divided'
partyo	/parti + o/	'He divided'

This rule, the gliding rule, is obviously ordered after stress placement since those vowels which glide, in many cases, play a part in stress placement. In addition, it will be ordered before vowel lowering since many of the high vowels which glide (the front ones) would lower and thus not glide if the order were otherwise. A rule which will account for the vowel glide alternation is rule (23).

(23) Gliding Rule

$$\begin{bmatrix} -\text{CNS} \\ +\text{High} \end{bmatrix} \rightarrow [-\text{Syllabic}] \; / \; \begin{bmatrix} \underline{\quad} \\ -\text{Stress} \end{bmatrix} \; \text{V}$$

The main stress rule preceded by the vowel raising rule, then, accounts for the data. We illustrate the rules presented so far in example #7.

Example #7

/señale/	/parti+s/	/parti+mos/	/parti+o/	/mete+o/	Underlying Forms
NA	NA	NA	(applies vacuously)	|metio|	Vowel Raising (22)
|señále|	|pártis|	|partímos|	|partió|	|metió|	Main Stress Rule (19)
|señál|	NA	NA	NA	NA	Apocope (8)
NA	NA	NA	|partyó|	|metyó|	Gliding (23)
NA	|pártes|	NA	NA	NA	Vowel Lowering (21) (Other Rules)
[señál]	[pártes]	[partímos]	[partyó]	[metyó]	Final Phonetic Form

Starting with rule (6) we found there were groups of lexemes whose stress it did not account for. Revising rule (6) as we introduced these groups, we arrived at (19) which accounted for all of the data. This then represents one solution to the problem of determining stress in Aragonese. There is, however, another solution taking a different approach which intuitively feels more correct. It claims that stress is penultimate in Aragonese and that all exceptions to this generalization are apparent only and can be explained by a second dependent generalization. To begin with let us restate the main stress rule in the form it was given under (6), that is in its penultimate form.

(6) $[+\text{Syllabic}] \rightarrow [+\text{Stress}] \; / \; _____ \; (C_oV) \; C_o\#$

Secondly, to get a complete grasp of the second generalization let us return to Charts V through VII for a better look. Notice that at the meeting of two vowels (hiatus) if one is stressed it will be the one which is lower (the case for [salyé] < /sali+ e/ and [trakeár])and if they are equal in heighth then the more back vowel will be stressed (the case for [benyú] < /beni + u/ and [múito]) otherwise the stress is penultimate.

To account for this regularity of pattern we must postulate a subsidiary rule for stress called stress shift which will be ordered after the main stress rule, (6), and which will shift stress in hiatuses from the vowel stressed by (6) to the other vowel if the proper conditions are met.

(24) STRESS SHIFT: If two vowels are in hiatus and one is stressed, move the stress to the other vowel if that vowel is lower; however, if they are equal in heighth, move the stress if the other vowel is more back.[14]

SD: $$*\begin{bmatrix} +\text{Syllabic} \\ +\text{Stress} \\ \begin{Bmatrix}[-\text{Back}] \\ [+\text{High}] \\ [-\text{Low}]\end{Bmatrix} \end{bmatrix}_1 \quad \begin{bmatrix} +\text{Syllabic} \\ -\text{Stress} \\ \begin{Bmatrix}[-\text{Back}] \\ [-\text{High}] \\ [+\text{Low}]\end{Bmatrix} \end{bmatrix}_2$$

a a

SC: 1 → [-Stress]
2 → [+Stress]

Notice that this rule explains all the irregular stress patterns exhibited in Charts V through VII. This is illustrated in example #8.

Example #8

/beniu/	/kanteis/	/saliores/	/muito/	/salie/	/raskleare/	Underlying Form
|benĺu|	|kantéis|	|salióres|	|muíto|	|salíe|	|raskleáre|	Main Stress (6)
|beniú|	NA	NA	|múito|	|salié|	NA	Stress Shift (24)
NA	NA	NA	NA	NA	|raskleár|	Apocope (8)
[benyú]	[kantéis]	[salyóres]	[múito]	[salyé]	[raskleár]	Final Phonetic Form

The issue is this: we have two solutions which both can account for the data; however, only one can be incorporated in the final grammar. Therefore, we must choose one of them as preferable in some nonarbitrary way. Compared in isolation from the rest of the grammar, the one involving (19) (henceforth A) would appear to be simpler than the solution involving (6) and (24) (henceforth B). However, as is well known, rules of particular solutions cannot be strictly compared in isolation from the rest of the grammar since they enter into functional relationships with other rules. Hence, the simpler solution in isolation may cause grave complications in the other parts of the grammar that the other more complex solution would not cause. If the complexity that it causes is greater than the complexity between it and the other solution, then, it should not be preferred.

With the above in mind, let us consider the following forms in Chart Ia which are exceptions under both solutions.

Chart Xa

anθía	'gum'
aβaðía	'rectory'
baθía	'bread kneading-trough'
xuðía	'kidney bean'
lexía	'bleach'
tía	'aunt'
tría	'act of separating sheep after returning from the mountains'

farrería	'blacksmith's shop'
mesðía	'noon day'
baðía	'rectory'
buyería	'drove of oxen'
θeβaðío	'mixture of oats and barley'
fusío	'spindle of a loom'
sekío	'drought'
tío	'uncle'
río	'river'

This pattern is also found in verb forms in the conditional tense in all the dialects.

Chart Xb

treβaʎaría	'I would work'
treβaʎarías	'You would work'
treβaʎaría	'He would work'
treβaʎarían	'We would work'
treβaʎaríats	'You (pl) would work'
treβaʎarían	'They would work'
faβlarías	'You would speak'
faβlaría	'He would speak'
faβlarían	'They would speak'

Notice that in the above data there is a hiatus in each of the lexemes. In each case the first vowel of the hiatus is stressed, however, according to both of our solutions the second vowel should be stressed. A possible solution to this problem is to postulate a nonsyllabic segment in the underlying forms between the vowels of the above hiatuses. If this segment were deleted after stress placement, properly stressed phonetic forms would be generated. For example, if some nonsyllabic, C*, were postulated in the underlying form of [faβlaría], i.e. /faβlar + i C*a/ present during stress placement, i.e., |faβlarí C*a| and then deleted, i.e., [faβlaría] the proper phonetic forms would be generated. It then remains to be seen exactly what the phonological form of C* is. It should be obvious that one could "invent" a segment that could be deleted under all circumstances. For example, we could postulate a uvular stop for the above lexemes and then delete it very easily since there are no uvular

stops in Aragonese. However, a linguistic theory ehich allowed the choice of a segment just because it was not present in the phonetic inventory would be undesireable and at the very best ad hoc since the number of choices would be quite extensive and the choice between them highly arbitrary. Instead we propose that the quality of this segment be selected in some nonarbitrary way. One highly plausible way that has been suggested would be to set up the constraint that this segment should fill in a phonological gap in the segmental patterning of Aragonese. That is, with respect to our situation, it should be a segment that is neutralized in the intervocalic environment but which is found phonetically in other environments. If the above constraint is accepted (See Kiparsky 1968b for more justification) and it should be since the alternative is an unconstrainable inventory of segments, then, the forms of ChartX will have to be considered as true exceptions since there are no segments in Aragonese which will satisfy the above constraint. That is, all underlying nonsyllabic segments are found phonetically in intervocalic position. The above conclusion that these forms should be treated as exceptions is further substantiated by the fact that they are not representative of a larger group. That is, the nonverbal forms of Chart Xa and the conditional tense endings of Chart Xb are to the best of my knowledge the only ones which exhibit this pattern. Therefore, what we have here is a small group of exceptional forms which must be treated accordingly. One treatment of these forms under solution A would involve marking them for stress in their lexical entries and, in addition, supplying them with the rule feature [-Rule (19)] so they would not undergo the main stress rule (See Lakoff 1970 for discussion of rule features). On the other hand, under solution B all that would be required would be the rule feature [-rule (24)] since the penultimate stress rule, (6), would stress them properly. That is these forms like all other forms would be stressed by the main stress rule. However, they would not be subject to the stress shift rule. The claim is, then, that these forms are not exceptions to the main stress rule but to a subsidiary stress rule. Since they all exhibit a penultimate stress pattern, this seems to be a reasonable claim. On the other hand, under solution A we marked all the forms for stress in their lexical entries. However, this does not seem reasonable in view of the fact that they all exhibit the same stress pattern, that is, by marking them for stress in their lexical forms, we are missing a generalization. To remedy this we would have

to postulate a second rule, rule "r", which would stress this small group of forms. There would be more involved to it than this, however, because we would have to insure that regularly stressed forms would not undergo this stress rule. The simplest way to do this would be to set up a minus next rule, rule "q", which would be ordered before rule "r" and then mark the forms of Chart X as [-rule q] in addition to marking them as [-rule (19)] as noted above. Thus all regular forms would undergo rule "q" and thus not undergo rule "r"; on the other hand, the forms of Chart X would not undergo "q" and thus would undergo "r" and be stressed properly. This treatment of these forms under solution A though more complex seems more reasonable than the first since it points out the exceptional status of these forms but, in addition, emphasizes their regularity in stress with respect to each other.

Comparing the two solutions with respect to the forms of Chart X, we can clearly see that solution B is preferable since it only involves one rule feature while A involves two rule features and two additional rules in the grammar. In addition, B claims that these forms are stressed regularly with respect to the main stress rule. This seems reasonable since they, like most other forms, are penultimately stressed; however, they are irregular with respect to the stress shift rule since the stress in a hiatus is normally found on the lower vowel. However, A makes these claims only in a very obscure way and only at the expense of additional framework. The above then seems to lend support to the intuitive feeling of the correctness of solution B.

When compared in isolation, A was clearly preferable over B, however, with the addition of the data in Chart X and the resultant explanations of it, B seems to be the one which should be preferred. Nevertheless, the situation is not as clear as it could be because one does not know exactly how to interpret rule (24) in terms of complexity. Stress shift, an historically well documented rule with a physical explanation behind the directionality of the shift in stress, cannot be stated simply within the notational framework of generative phonology as it is now set up. If it could be written simpler,B would decisively be preferable; however, even in view of the above, we can choose solution B because of the extra framework involved with A and particularly because of the use of the minus next rule which should be very costly in a grammar due to its arbitrary nature.

There is some additional but weaker evidence, historical and theoretical in content, which seems to vindicate our choice of solution B as the more correct one. To begin with let us assume position B for simplicity of exposition. With this in mind, consider the masculine past participles of Chart XI which appear to be exceptions to stress shift.

Chart XI

fuɣíu	'e caped'
dormíu	'slept'
benío	'come'
sentío	'felt'
faθío	'done'
kayío	'fallen'
tenío	'had'
reðío	'laughed'
biβío	'drink'
saλío	'left'
treβaλáu	'worked'
paɣáu	'paid'
kantáu	'sung'
tornáu	'returned'
sabéu	'known'

One might object to the stress shift rule on the basis that it violates some of the above data. On the surface this appears to be a valid objection because there does exist a group of lexemes in some of the dialects which do not undergo stress shift but which apparently do meet its structural description. Compare the above set of forms with a corresponding set from another dialect.

Chart XII

dormyú	'slept'
benyú	'come'
sentyú	'felt'
rompyú	'broken'
suβyú	'known'

This set of forms unlike the ones of Chart XI have undergone stress shift. A solution that suggests itself is that the first set of dialects lack the stress shift rule. However, forms like [sofráina, maðéiša, λéuta, peláire, pyáina, aßryé] from these dialects indicate that stress shift is also in their grammars. The question is then how do we account for the exceptional forms in these dialects if they cannot be accounted for on the grounds that stress shift is missing.

For a clearer view into the answer of this problem let us take a look at the morphological make-up of the past participle. Notice that morphophonemically the masculine form of the past participle in both sets of dialects will end in a two vowel sequence, the first vowel of the sequence being the stem vowel of the verb and the second appearing to be the phonological realization of the past participle and masculine gender morphemes. On the other hand the feminine form of the past participle ends in a consonant-vowel sequence which is immediately preceded by the stem vowel. The consonant-vowel sequence appears to be the phonological realization of the past participle and feminine gender morphemes.

Chart XIII

dormíδa	'slept'
beníδa	'come'
suβíδa	'known'
saβéδa	'known'
treβaλáδa	'worked'
sentíδa	'felt'
tornáδa	'returned'

It thus appears as if "u" and "ða" are in morphemic alternation. On independent grounds "o ~ u" and "a" can be determined to be the phonetic realizations of the masculine and feminine gender morphemes respectively as Chart XIV shows.

Chart XIV

gwéso	'bone'	M
péĉo	'chest'	M
náso	'nose'	M
alagárto	'lizard'	M

aš́áu	'bread gravy'	M
enronáu	'dirty'	M
kuñáu	'brother-in-law'	M
foráu	'headwound'	M
kára	'face'	F
bárβa	'tip of the chin'	F
kaβésa	'head'	F
kása	'house'	F
formíya	'ant'	F[16]

M=masculine F=feminine

If the "a" of "da" represents the feminine gender morpheme then "d" probably represents the past participle morpheme. On the other hand, the "u" of the masculine participle does not seem to be an analogous case because it alone appears to be representing the past participle and masculine gender morphemes. One possible solution to this anomaly is not to consider the "d" and "a" of "da" as participle and gender morphemes respectively but to treat "da" and "u" as portmonteau morphs, that is, they each represent two morphemes. They both would represent the participle morpheme and individually "da" the feminine gender morpheme and "u" the masculine gender morpheme. This would result in a morphological spelling rule approximating the following.

(25)

$$[+\text{Participle}] \rightarrow \left\{ \begin{array}{l} /da/ \;/\; \left[\underline{\quad} \; +\text{Fem} \right] \\ /u/ \;/\; \left[\underline{\quad} \; -\text{Fem} \right] \end{array} \right\}$$

The above rule, however, seems to be missing a generalization. The fact that "u (o)" usually represents the masculine gender affix and "a" usually represents the feminine gender affix is obscured by it. This rule, in fact, complicates the regular gender spelling rules because now they must be restricted so as not to apply to the participle forms.

A second solution not causing these complications would be to consider the final "a" (of "da") and "u" of the participle forms as the phonetic realizations of the feminine and masculine gender morphemes respectively. The gender spelling rules would then not be complicated (they would also apply to the participles). This would mean that the participle morpheme would have a null representation in masculine forms. A rule approximating this is rule (26).

(26)

$$[+\text{Participle}] \rightarrow \left\{ \begin{array}{l} \emptyset \ / \ \underline{\quad} \ [-\text{Fem}] \\ /d/ \ / \ \underline{\quad} \ [+\text{Fem}] \end{array} \right\}$$

The above rule, however, although capable of generating the past participles, does not alleviate our stress problem. That is, it does not contribute to an explanation of the placement of stress in the forms of Chart XI. In addition, there are other forms which are not participles in which a "d" is missing in the masculine forms, for example [kuñáða:kuñáu] ("sister-in-law:brother-in-law"). A solution which would handle forms such as these in addition to the stress problem would be preferable.

A third approach to the problem would be to consider that all past participle morphemes receive the same phonological spelling, that is, they are spelled as "d".

(27) $[+\text{Participle}] \rightarrow /d/$

This rule is much simpler than rules (25) and (26) and like (26) it does not complicate the gender spelling rules. However, it requires the addition of a rule in the phonological component that is not required by rules (25) and (26). The explanatory value, if any, that this phonological rule can supply will determine if it is to be accepted into the grammar. Consider once again the participle forms of the first set of dialects. Examples of masculine and feminine forms are respectively [kantáu:kantaða, dormíu: dormíða], etc. Above we postulated a /d/ as the phonological realization of the participle morpheme. Thus "kantáu" and "dormíu" would respectively be in their underlying forms /kanta+ d+ u/ and /dormi+ d+ u/. A rule which would account for the loss of "d" in the masculine participle and thus for the canonical difference between it and the feminine participle would be consonant syncope.

(28) Consonant Syncope

$$\begin{bmatrix} +\text{CNS} \\ +\text{COR} \\ +\text{ANT} \\ -\text{CNT} \\ +\text{VCE} \end{bmatrix} \rightarrow \emptyset \ / \ [+\text{Stress}] \ \underline{\quad} \ \begin{bmatrix} +\text{Syllabic} \\ +\text{Back} \\ -\text{Low} \end{bmatrix}$$

This rule not only explains the absence of "d" before "u" in the participles but also in nonparticipial forms ([kuñáu, kuñáða]). More importantly, it explains why some of the participial forms are exceptions to stress shift. If rule (28), consonant syncope, is ordered after stress shift, rule (24), then the hiatuses formed by rule (28) cannot be subject to stress shift. Therefore, the stress would remain on the penultimate vowel.

Example #9

/kanta+d+u/	/dormi+d+u/	/dormi+d+a/	Underlying Form
|kantádu|	|dormídu|	|dormída|	Main Stress (6)
NA	NA	NA	Stress Shift (24)
|kantáu|	|dormíu|	NA	Consonant Syncope (28) (Other rules)
[kantáu]	[dormíu]	[dormíða]	Phonetic Form

The linear ordering of consonant syncope after stress shift then explains the exceptional behavior of the participles with respect to stress shift in the first set of dialects. Now consider the corresponding participles in the second set of dialects. From Chart Vb we have the forms [rompyú, suβyú, sentyú, benyú, kisyú]. In these forms the stress is on the final vowel of the underlying hiatus. It then appears that these hiatuses are subject to stress shift in this dialect as opposed to the other dialects where they are not. We can account for this very easily by assuming that rule (25), consonant syncope, is ordered before rule (24), stress shift, in this dialect. Thus these hiatuses are formed before stress shift applies and thus are subject to it. Using the same forms as in example #9, we illustrate this in example #10.

Example #10

/kanta+d+u/	/dormi+d+u/	/dormi+d+a/	Underlying Form
|kantádu|	|dormídu|	|dormída|	Penult Stress (6)
|kantáu|	|dormíu|	NA	Consonant Syncope (28)
NA	|dormiú|	NA	Stress Shift (24)
NA	|dormyú|	NA	Gliding (23) (Other rules)
[kantáu]	[dormyú]	[dormíða]	Final Phonetic Form

Here is then a case where two intimately related sets of dialects have the same rules but in a different linear order. Historically (according to Alvar-Lopez (1947, 1953)) the case was that for all dialects the stress in these constructions was on the penultimate vowel thus historically consonant syncope was ordered after stress shift.

Notice that the change in rule order makes stress shift more productive (that is, it applies to more forms). In fact a particular type of relationship has come about as a result of this reordering. The C-syncope rule now creates representations for stress shift to which otherwise stress shift would have been inapplicable. Following Kiparsky we term this relationship a Feeding Relationship and call the C-syncope rule a Feeding Rule relative to stress shift. Kiparsky besides labeling various functional rule relationships has, in addition, stated a well supported maxim by which rules will reorder which is "Rules tend to shift into the order which allows their fullest utilization in the grammar." (Kiparsky 1968a:200) The assumption is that rules do not reorder haphazardly but reorder according to this principle. It can easily be seen that this principle explains why C-syncope and stress shift have reordered in the one set of dialects, that is, the ordering of C-syncope before stress shift allows stress shift to be more fully utilized.

To account for the above participles in the second set of dialects (Chart IX) under solution A, that is, the solution which involved (19), we would have to order C-syncope before the main stress rule (19). On the other hand, to account for the participles in the first set of dialects, we would have to order C-syncope after the main stress rule. Therefore, the hiatuses formed by C-syncope would not be subject to the main stress rule. We stated earlier that the situation historically was that C-syncope was ordered after stress placement thus the stress was originally always on the penultimate vowel of those forms which undergo C-syncope. Notice though that the shift in linear order under solution A of the C-syncope rule from after the main stress rule to before the main stress rule does not mean that (19) is going to be more fully utilized. That is, the stress rule operates on just as many forms before the change as after. Certain subrules of the main stress rule do become more productive at the espense of others, but the stress rule itself is not more productive. This shifting of rules in the linear order is haphazard since there is no principle behind it.

It represents a strange anomaly in view of the fact that there are no known reorderings which cannot be explained by Kiparsky's principle. On the other hand, under solution B the reordering of C-syncope and stress shift is not anomaly but a perfectly explainable phenomenon under Kiparsky's principle. This provides some indirect evidence that our choice of solution B is the correct one.

In addition to the above, one might note that under solution A the statement of the C-syncope rule is different when it is ordered before (19) as in the second set of dialects than when it is ordered after (19) in the first set. That is, it will be stated as above (the same as under solution B) when it is ordered after the main stress rule; however, when it is ordered before the main stress rule it must be stated in a more complicated form. This results from the fact that in the rule we stated above we used stress as part of the structural description. This seems to be compatible with the facts since [d]'s do not undergo syncope before all nonlow back vowels but only those which immediately follow the stressed vowel. Therefore, when this rule is ordered before main stress in dialect E under solution A, it will somehow have to incorporate the fact that it is the [d] which follows the stressed vowel which is deleted. This can be done by incorporating the structural description of the penultimate subrule of (19) into the C-syncope rule.

$$d \rightarrow \emptyset \;/\; V \;____\; \begin{bmatrix} +\text{Syl} \\ +\text{Back} \\ -\text{Low} \end{bmatrix} \quad C_o \; \#$$

However this is a more complicated rule than the one needed under solution B (rule (28) above) for the same dialect. Thus solution B provides a slightly simpler solution with respect to C-syncope in the dialects which have reordered. Therefore in this dialect we have even more evidence for the preferability of B; however, the solution is the same with respect to dialects B and D. This brings up another curious aspect of solution A, that is, why should the C-syncope have to be formulated differently when it is ordered after main stress when the results of it are identical. This is probably a result of the fact that C-syncope is reliant upon stress and that if it is ordered before stress we will have to incorporate into it the stress rule in some form. Solution B, then, with a main stress rule which would always precede C-syncope and a stress shift rule which would sometimes follow C-syncope would always express this fact.

The above evidence, both indirect (haphazard versus principled reordering) and direct (the simpler C-syncope rule under B as opposed to solution A, however, which is only good for the one set of dialects is hardly crushing evidence for the preferability of B to A, but it does help confirm the evidence presented earlier.

In summary, then, presented with two solutions to stress placement, one involving a single complex rule (A) and the other, two rules one simple and one complex (B), we had to choose between them. Compared in isolation from the rest of the grammar, the first solution appeared to be simpler; however, it was discovered after looking at other parts of the grammar that the first solution caused complications that the second did not and thus was not to be preferred. However, it must be admitted that this argument involving the exceptional forms that was presented to show the preferability of B to A is not as conclusive as one might desire in such a situation. That is, the difference in complexity between the two solutions with respect to the exceptional forms of Chart X is difficult to compare with the difference in complexity between the stress placement rules of the solutions themselves. This is due to the fact that the conditions placed on the stress shift rule are difficult to interpret in terms of simplicity (as it has been discussed in the li erature to date). It does seem, though, even with this that the simplicity caused by solution B with respect to the exceptional forms is greater than the differences between stress placement rules, and for this reason solution B will be preferred. In addition, we had indirect evidence which seemed to confirm our choice of B; however, this evidence cannot (and did not) bear directly on our decision.

2. At the beginning of this paper it was said that the purpose of the study was to establish that stress was regular in Aragonese. The most predominant stress pattern was found to be penultimate, however, there were many large groups of lexemes displaying other stress patterns. These groups constituted a mass of apparent exceptions to the penultimate stress rule. It was shown, though, after a closer inspection that these groups of lexemes (excepting one small group) did not constitute exceptions at all, but, in fact, were quite regular. So what at first appeared to be a very chaotic stress situation turned out to be very regular. However, it was found that two solutions were, in fact, applicable to the data, but after

research one appeared to be more preferable (though the evidence was not as conclusive as one might desire). Thus a penultimate stress rule[12] and a subsidiary stress rule of stress shift along with other independently motivated rules accounted for the various stress patterns in Aragonese.[13] In addition, what few differences that did exist between the dialects with respect to stress were shown to exist as a result of rule reordering.

NOTES

1. The theory of grammar within which this paper is written is usually referred to as the transformational model. A transformational grammar is composed of a central syntactic component and two interpretative components, the semantic and phonological. It is the latter component which we are specifically concerned with here. For a detailed treatment of the structure of phonological component in a transformational grammar see Chomsky and Halle 1968, Harms 1968, and Postal 1968.

2. Aragonese is spoken in the mountainous region of northeastern Spain. Bordered on the west by Castilian and on the east by Catalan, the speakers of Aragonese for centuries have been under constant pressure to accept features from these languages. Castilian has made extensive inroads into Aragonese generally along the western frontiers of Aragon but especially in the southwest. Catalan, on the other hand, has made small inroads in the eastern regions of Aragon.

3. This study is based mainly on the work of three men: Günther Haensch, Antonio Badía Margarit, and Manuel Alvar Lopez. All three men did not approach the study of Aragonese grammar from the point of view of theoretical of model grammar. Instead their works are in the main data collections. That is, they are long lists of lexemes and verb paradigms with sparse historical comments. Few, if any, conclusions are reached. This is not to say that their labor has not been fruitful since in effect a good data collection is useful for any linguist wishing to do further work on the language. However, even good data collections will have their limitations for a linguist who might want to do a more definitive study in some specific area, but this limitation would be found in all general studies, theoretical or nontheoretical. More primary research should be done in all areas

covered by this paper; however, it is doubtful whether it would radically modify the conclusions reached in it. The collections of data gathered by Günther Haensch and Antonio Badía Margarit respectively for the eastern and central areas of Aragonese are extremely well done and relatively complete. The data collection by Manuel Alvar Lopez for the western area though helpful is not well done and not complete at all.

4. Since this is not a study of data that was collected by the writer, but one of material that was collected previously by other writers, certain difficulties have been encountered. One that particularly needs to be pointed out is that certain gaps exist in the data and that these cannot be filled without further field work. This is particularly noticeable when one tries to find corresponding linguistic forms from dialect to dialect. Only in the rare cases are corresponding linguistic forms found documented in all five dialects. A documentation in two or three dialects for a particular form is more common.

5. The phonetic symbols used throughout this paper have the values usually associated with them by the International Phonetic Association. Those which differ or are not used by the Association are listed below.

ð	dental voiced fricative
ĉ	alveopalatal voiceless affricate
ĵ	alveopalatal voiced affricate
š	alveopalatal voiceless fricative
ž	alveopalatal voiced fricative
ñ	palatal nasal sonorant
λ	palatal lateral sonorant

6. This rule, if it is to account for monosyllabic words (not given above), will have to be elaborated. Since this is a minor modification, this will be done in a later version of the rule.

7. This does not exhaust the group of lexemes that have this pattern because in addition to many more substantives of this type, there are many examples of this type from the verb conjugations.

8. This is not to say that exception features do not have a place in transformational grammars but only that their use should be kept to a minimum. Sporadic exceptions do occur and should be pointed out; however, the lexemes of which the ones of Chart IV are representative are not sporadic and are relatively numerous.

9. The forms of Chart IV, however, are not completely regular. The fact that these substantives do not end in vowels intheir underlying forms means that they do not undergo the gender spelling rule. All lexical entries of this type would have to be marked [-Gender spelling]. Notice that this results in a simpler solution (the one we have presented) than if we were to assume that they did undergo gender spelling (which amounts to treating them as exceptions on the phonological level). If we assumed the latter, these entries would have to be marked [-Rule 6], but, in addition, another rule, an antepenultimate stress rule, would have to be written in order to stress them properly. This is not all though, because under the principles of transformational grammar each lexical entry is automatically [Rule n] for each n in the grammar. In order to block the antepenultimate stress rule from applying to the mass of regular forms (in the most economical way possible), we would have to postulate rule "q", q) [+Seg] → [-Next Rule], which would be ordered immediately before the antepenultimate stress rule. In addition, we would have to mark the forms of Chart IV as minus [-Rule q]. The mass of regular forms would then be excepted from the antepenultimate stress rule by rule "q", but the forms of Chart IV would be expected from "q" and thus would undergo the antepenultimate stress rule. A derivation for the above solution would look like the following:

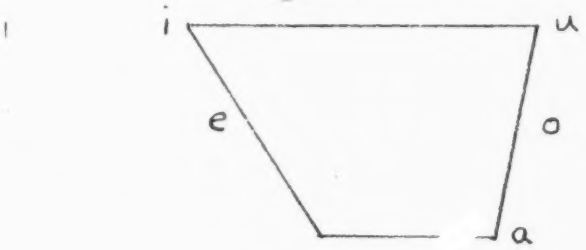
/mokadore/	/señale/	Underlying Forms
-Rule 6		
-Rule q		
NA	|señále|	6
NA	|señále|	q
|mokádore|	NA	Antepenultimate Stress rule
|mokádor|	|señál|	Apocope (8)
|mokáðor|	|señál|	Final Phonetic

It should be obvious that there is quite a bit more involved in this solution than the one we presented in the text; therefore, the solution of the text should be preferred.

10. At first sight one might think that stress shift is a strange rule. However, this is not the case at all. In fact, it is really a very natural rule that has a diachronic counterpart that is well documented historically in SW Romance.

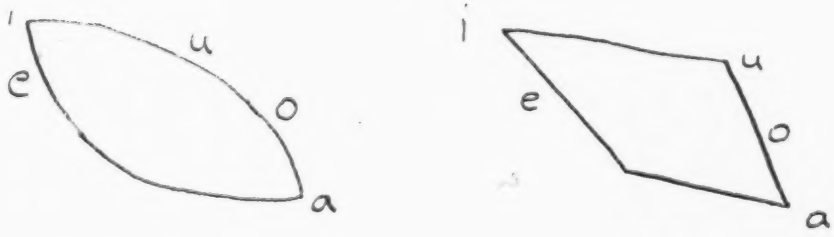
To begin with, some of the common vowel quadrangles do not represent the positions of the vowels in the mouth as accurately as we might think. Figure one is representative of these quandrangles.

Figure 1



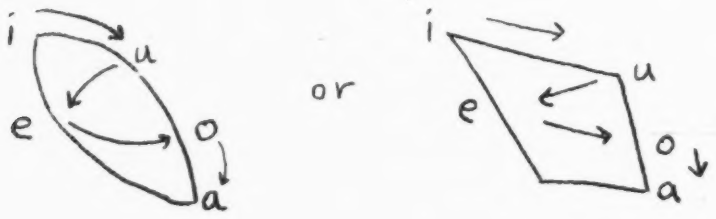
Notice that these quadrangles represent the front vowels and their corresponding back vowels, i.e. (i,u), (e,o), as being equal in heighth. However, this does not seem to be the case because the back vowels are usually slightly lower than their corresponding front counterparts. Figure two is more realistic drawing of the vowels in relationship to each other.

Figure 2



Notice that [u] is lower than [i] and [o] lower than [e]. The progression from the highest vowel to the lowest vowel would then be [i, u, e, o, a]. The case for stress shift both diachronically and synchronically is when [i] is in hiatus with either [u], [e], [o] or [a], and if stress is present, the latter will be stressed. If [u] is in hiatus with either [e], [o], or [a] and if stress is present, the latter will be stressed. If [e] is in hiatus with either [o] or [a] and if stress is present, the latter will be stressed. If [o] is in hiatus with [a] and if stress is present, then the latter will be stressed. We then have a shift in stress as portrayed in Figure three where the transitive relation ensues.

Figure 3



The stress then shifts from higher vowels to lower vowels and since [u] and [o] are respectively lower than [i] and [e], backness also entails being lower. The rule for stress shift is then simply: if two vowels are in hiatus and if one is stressed, move the stress to the other vowel if it is lower. Another interesting fact is that the number of cycles per second of the resonance frequency of the first formant of these vowels which has a rough correlation with vowel heighth directly corresponds with the direction of stress shift.

Figure 4

Approximate Resonance Frequency of Formant One

i	270	cps
u	300	cps
e	500	cps
o	550	cps
a	730	cps

In other words, all we have to say is that if two vowels are in hiatus and if one is stressed by (6), move the stress to the other vowel if that vowel has a higher frequency for formant one, i.e. if it is lower. It then appears that stress shift is in fact a very natural rule with a physical explanation for its directionality.

11. Before proceeding we can clear up the matter of the masculine gender morpheme. Consider some of the lexemes of Chart XIV once again.

Chart XIV

gwéso	'bone'
péĉo	'chest'
náso	'nose'
alagárto	'lizard'
ašáu	'bread gravy'
enronáu	'dirty'
kuñáu	'brother-in-law'
foráu	'headwound'

All of the above forms are masculine and the final vowel of each lexeme is the phonetic realization of the masculine gender morpheme. It is easily seen that there is an alternation between [u] and [o], that is, [u] occurs after syllabic segments, [o] occurs after nonsyllabic segments. The following forms help confirm this observation.

Chart XIVa

pekwáryo	'vetinarian'
pré yo	'especie of castigo'
sárryo	'cabamontes'
símyo	'dicese del trigo que lleva'
sírryo	'poca sutancia sirle'
nó yo	'sweetheart (male)'
matrimónyo	'marriage'
endámyo	'andamio'

To account for the above data we could assume that the masculine gender vowel is unmarked for highness and adjust the highness by a general rule which would have the highness agree with the syllabicity of the preceding segment. Rule (29) would be an approximation of this rule.

(29) Highness Adjustment Rule

$$\begin{bmatrix} +\text{Syllabic} \\ +\text{Back} \\ -\text{Low} \end{bmatrix} \rightarrow [\alpha\text{High}] \; / \; [\alpha\text{SYL}] \; \underline{\quad} \; C_o \; \#$$

There are some forms, however, which do not seem to follow this pattern.

Chart XIVb

dormyú	'slept'
benyú	'come'
sentyú	'felt'
rompyú	'broken'

However, as was shown earlier in the discussion, the glides of the above forms must be considered to be syllabic in the underlying form. If we assume that the gliding rule, rule (23), is ordered after the highness adjustment rule, then the grammatical forms will be generated. That is, at the time of highness adjustment, the above lexemes will respectively look like |dormiʊ̈, beniʊ̈, sentiʊ̈|. The final nonlow vowel then will adjust to an underlying syllabic segment. Now consider the following forms which are representative of a large group of verbs.

Chart XIVc

metyó	'He put'
poδyó	'He was able'
partyó	'He divided'
salyó	'He left'

The glides of the above forms must also be considered syllabic in the underlying form. In addition, they must be considered syllabic at the time highness adjustment applies since they are glided at the same time the stem segments of Chart XIVb are. Under the solution we have proposed, the ungrammatical [metyú, poδyú, partyú, salyú] would be generated for the third person singular preterite forms. Notice however, as stated above, that these final vowels are not masculine gender vowels as the

rest are; that is, they represent the third person preterite singular. A possible solution, then, is to give the third person preterite singular morpheme a distinct phonological representation from the masculine gender morpheme. Since it only is realized as [o], let us assume that its phonological realization is /o/. If its representation is /o/ and if the masculine gender vowel must be distinct from it, the most obvious phonological representation for the masculine gender vowel is then /u/. Assuming this as our base, we can now make the following observations. That is, "u"s become "o"s after consonants but "o"s do not become "u"s after vowels. We should therefore limit rule (29) to the following.

(30) Highness Adjustment Rule

$$\begin{bmatrix} +\text{SYL} \\ \\ +\text{BACK} \end{bmatrix} \rightarrow \quad [-\text{High}] \;/\; [-\text{Syllabic}] \;____\; C_o \;\#$$

This rule, in conjunction with the proper choice of underlying forms, then accounts for our data in a maximally simple way.

12. This may not exactly be true for all of Aragonese because in Eastern Aragonese there appears to be a group of verbs which take antepenultimate stress in the infinitives. For example [móure] from /mobe + re/, [déure] from /debe + re/, [pódre] from /pote + re/, etc. Since the group of verbs with this pattern is relatively small and is found only in Eastern Aragonese its existence will affect our overall solution for Aragonese very little. However, there seems to be two possible ways of handling these forms. One would be to let the main stress rule apply to them. This would result in a revised main stress rule for Eastern Aragonese. The second solution would be to handle them as exceptions to the main stress rule (6) and have them stressed by a subsidiary antepenultimate stress rule. More study, however, needs to be done before a decision can be made between these two approaches.

13. There is another group of apparent exceptions to our stress placement rules, however, that exists in eastern dialects. Consider the following chart.

Chart XV

ríus	'You laugh'
ríu	'He laughs'
reðíu	'You laugh (pl)'
ríure	'To laugh'
beníu	'You sell (pl)'
bíus	'You live'
bíu	'He lives'
biβíu	'You live (pl)'
bíure	'To live'
teníu	'You have (pl)'
dormíu	'You sleep (pl)'
beníu	'You come (pl)'
eskríure	'To write'
eskríus	'You write'
eskríu	'He writes'

The syllabicity of the underlined segments in words like "dormíu, kantáu, ríu, ríus, and bíure" appears to be that of a vowel. Spanish linguists represent this segment in phonetic notation as [u], however, we should not consider this representation as being as alternant of [w] as is sometimes done in the United States. The Spanish use both representations in their phonetic orthography. The latter representation, [w], is used for the nonsyllabic labiovelar semiconsonant which is similar to the initial segment of the English word wet [wet]. If [u] is not a semiconsonant then what is it? On structural grounds, these segments act like vowels since they are capable of taking stress. For example, historically "dormyú" came from "dormíu" in dialect E. In addition, as we have shown in the text, these segments in some of their instances seem to be playing an integral part in stress placement. Both pieces of evidence, historical and synchronic, then seem to indicate that the symbol [u] stands for a vowel like segment. Indeed the fact that they have vowel quality has been noted by Tomás Navarro, the Spanish phonetician who says that this type of segment "mantiene claramente su timbre vocálica de [u] más o menos cerrada." (Navarro 1966:62-63) My own acoustic investigations of the segments for which the symbols [i] (the front counterpart of [u]) and [u] have been used to represent also show that they are syllabic (=vocálico of Navarro) segments though very brief.

Notice that the stress has not shifted to the back vowel in the above hiatuses. As noted above stress shift appeats to be operative in all Aragonese dialects. Since the lexemes of Chart XV are representative of quite a large group of forms the use of exception features to pronibit them from undergoing stress shift would be quite expensive in terms of the simplicity metric. So expensive in fact that it might be more fruitful to drop the stress shift rule. This in turn would cause complications in the lexemes that do seem to undergo stress shift (they would now be exceptions to the main stress rule). If we are to hold on to the generalization of stress shift and at the same time not be belabored with an excessive amount of exception features, then we must find a systematic way to account for the lexemes of Chart XV. Towards this end let us consider the lexemes of Chart XVI.

Chart XVI

reðím	'We laugh'
reðíβa	'He was laughing'
reðíse	'He might laugh'
reðít	'laughed'
biβím	'We live'
bíβen	'They live'
biβít	'lived'
eskríβo	'I write'
eskriβím	'We write'
eskriβíu	'You write (pl)'

Now consider a complete paradigm of the verb 'move'.

Chart XVII

móβo	'I move'
móus	'You move'
móu	'He moves'
moβém	'We move'
moβéu	'You move (pl)'
móβen	'They move'
moβéβa	'He was moving'
móβa	'He may move'
moβét	'moved'
móure	'to move'

Without going into detail, it should be clear from the above charts that the stems which will account for the various related lexemes and their respective paradigms are going to have to contain a consonant, otherwise, all members of the respective paradigms cannot be accounted for. The underlying form of the stem, from which the lexemes of the paradigm of Chart XVII can best be derived, appears to be /mobe/. Two rules which will account for alternations in the stem such as "móu" and "moβém" are vowel apocopation which we discussed earlier and a new rule which I will call consonant vocalization. The underlying form of "móu" would be /mobe + ∅/ where the third person singular indicative has a null representation. Rule (8), the vowel apocopation rule, would apply to the phonological representation |móbe| and make it |mób|. This now brings us to our new rule, vocalization, which changes certain final and preconsonantal consonants into vowels. For the data we have given above, the following informal form of the rule will suffice.

(31) Consonant Vocalization

$$\left\{\begin{matrix} d \\ b \end{matrix}\right\} \rightarrow u \; / \; \underline{\qquad} \left\{\begin{matrix} \# \\ C \end{matrix}\right\}$$

This rule would then derive [móu] from |mób|. Since the "β" in "moβém" is intervocalic, it does not vocalize. Once an extension is made on our apocope rule to apocopate vowels also before final [s] all the above forms will be handled quite easily.

Example #11

/mobe+s/	/mobe+de/	/λeši+u/	/ridi+∅/	/ridi+s/	/ridi+de/	Underlying Form
|móbes|	|mobéde|	|λešíu|	|rídi|	|rídis|	|ridíde|	Stress (6)
NA	NA	|λešiú|	NA	NA	NA	Stress Shift (24)
|móbs|	|mobéd|	NA	|rídi|	|rídis|	|ridíd|	Apocope (8)
|móus|	|mobéu|	NA	|ríu|	|ríus|	|ridíu|	Vocalization (31)
NA	NA	|λešyú|	NA	NA	NA	Gliding (23) (Other rules)
[móus]	[moβéu]	[λešyú]	[ríus]	[ríus]	[reðíu]	Final Phonetic Form

|móbe+s| by the extended apocope rule then will become |móbs| which by vocalization becomes [móus]. [mobéu] would derive from an underlying form like /mobe+de/ which after stress is |mobéde| then through apocope becomes |mobéd| and later by vocalization [mobéu]. The rest of the forms are derived in an analogous way. All the hiatuses of Chart XV then come into existence as a result of consonant vocalization. If we assume vocalization to be linearly ordered after stress shift then these hiatuses are not subject to it simply because they were nonexistent at the place in the grammar where stress shift operated. The linear order of stress shift and vocalization then explains the apparent exceptions to stress shift of Chart XV. We are thus able not only to hold on to our generalization of stress shift without burdening the grammar with exception features, but, in addition, add a new generalization of consonant vocalization to the grammar.

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'TO BE' IN RUSSIAN

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ABSTRACT

The Russian verb byt' 'to be' has different functions in different constructions. It is argued that it therefore represents several different verbs. A number of tests applied to sentences containing byt' show that there are four such verbs: a tense marker, which is a surface structure insert, and three deep, or deeper, surface inserts: the copula, the form that links the subject with an adverb, and the true verb.

1. The scope of the problem. The aim of this paper is to study some aspects of the deep structure of the verb byt'. Judging by the variance in the behavior of this "colourless," short surface realization of to be in Russian, there exist several different verbs: a tense marker, a copula and a full-fledged lexical verb. These differences can first of all be brought out by their synonyms, such as:

sushchestvovat' - to exist (as in 1. "Truth exists.")
imet'sa - to be available (as in 2. "Many books are available in the library.")
nakhodit'sa - to be found (as in 3. "The painting is to be found in the museum.")
imet' mesto - to take place (as in 4. "The meeting took place on Friday.")
proiskhodit' - to go on (as in 5. "What is going on there?")
sluchat'sa - to occur, to happen (as in 6. "What happened there?")
poiti - to go (as in 7. "You will go to them.")
priiti - to come (as in 8. "Will you come for dinner?")
imet' - to have (as in 9. "Ivan has a car.")
iavliat'sa - to appear, to constitute (as in 10. "Hydrogen constitutes a part of water.")

All these parallels of byt' are listed here just to illustrate the complexity of its use and difference of meaning that it can have.

The verb byt' could be substituted for any of its equivalents in the sentences above, but in formal or scientific texts these equivalents are preferred over byt'.

The only use of byt' that does not have an equivalent is that of a tense marker in the analytic future of verbs and passive participles as in

(11) Ia budu rabotat' (I will work).[1]

In order to show the different meanings illustrated in (1) - (10), the following constructions with byt' are presented below:

1. As a tense marker used with verbs and participles: NP byt' $\begin{matrix} V \\ Part \end{matrix}$

   (12) Ivan budet rabotat' (Ivan will work)

   (13) Ivan byl priglashon (Ivan was invited)

   (14) Ivan priglashon (Ivan is invited)

   (15) Ivan budet priglashon (Ivan will be invited)

2. As a copula between two noun phrases: NP_1 byt' NP_2

   (16) Ivan byl studentom (Ivan was a student)

   (17) Ivan student (Ivan is a student)

   (18) Ivan budet studentom (Ivan will be a student)

3. As a copula between a noun phrase and an adjective: NP byt' Adj

   (19) Ivan byl dobrym (Ivan was kind)

   (20) Ivan dobryi (Ivan is kind)

   (21) Ivan budet dobrym (Ivan will be kind)

4. As a link between a noun phrase and an adverb: NP byt' $\begin{matrix} time \\ manner \\ loc \end{matrix}$

   loc byt' NP

   (22) Ivan byl rano (Ivan was early)

   (23) *Ivan rano (Ivan is early)

   (24) Ivan budet rano (Ivan will be early)

   (25) *Ivan byl khorosho (Ivan was well)

   (26) *Ivan khorosho (Ivan is well)

   (27) *Ivan budet khorosho (Ivan will be well)

   (28) Ivan byl doma (Ivan was home)

   (29) Ivan doma (Ivan is home)

   (30) Ivan budet doma (Ivan will be home)

   (31) Kniga byla u Ivana (The book was at Ivan's)

   (32) Kniga u Ivana (The book is at Ivan's)

   (33) Kniga budet u Ivana (The book will be at Ivan's)

   (34) U Ivana byla kniga (Ivan had a book)

(35) U Ivana Kniga (Ivan has a book)

(36) U Ivana budet kniga (Ivan will have a book)

5. As a full-fledged intransitive verb: NP byt'

(37) Bog byl (God was)

(38) Bog est' (God is)

(39) Bog budet (God will be)

A working assumption will be made here that these constructions take care of all uses and occurrences of byt'. In the paragraphs below, it will be attempted to distinguish the transformationally inserted byt' from the deep-structure one.

2. Byt' as a tense marker. Darden's (1969) main argument against considering the verb to be, in English and in several other languages, a deep-structure verb is that "if it has no semantic meaning, it cannot exist on the level of deep structure." On the basis of this assumption it can be claimed that in the analytic future the form byt' is introduced by the combination of tense and aspect features, and that it has no semantic meaning, because the differences between the present, which is always imperfective,

(40) On chitaet (He is reading),

and the future imperfective,

(41) On budet chitat' (He will be reading),

lies merely in the tense; no other changes in the meaning could be found.

Another indication of an absolute lack of semantic value in this occurrence of byt' is the fact that it has no lexical equivalents.

The tense marker byt' also has no indication as to being plus or minus stative; or, one should say that it can be both in the same construction. If we consider the verb phrase in

(42) On budet spat' (He will be sleeping),

to be stative, and the verb phrase in

(43) On budet puteshestvovat' (He will be travelling), nonstative, then, stativeness is determined by the infinitive of the regular verb.

The test of gapping shows the dependence of byt' on the verb, as in

(44) On budet chitat' knigu, a ia gazetu (He will be reading a book, and I a newspaper).

The tense marker must be omitted together with the main verb. Since the tense marker cannot be omitted without the verb, no gapping can take place.

The participial constructions differ from the analytic future in the sense that byt' may not be omitted in the past and future as a result of gapping:

(45) On byl ranen, a soldat byl ubit (He was wounded, but the soldier was killed).

(45a) *On byl ranen, a soldat ubit (He was wounded, but the soldier is killed).

The omission of byl in the second conjoined sentence in (45a) is the present tense marker, and would not give the idea that the verb byt' or any other verb is implied. This is the reason why (45a) cannot be interpreted as a case of gapping, but rather as a case where two sentences with different tenses have been conjoined.

It is impossible to test the tense marker by questioning it; the language simply does not have a question for it.

The test of conjoining of sentences containing byt' as a tense marker with sentences, where the function of byt' is different, depends on the semantic value of the verb in the infinitive:

(46) *On budet chitat' i budet chitat' (He will be a student and will read);

(47) On budet chitat' i budet umnym (He will read and will be smart);

(48) On budet rabotat' i budet pisat' (He will work and read).

Sentence (46) is ungrammatical from the semantic point of view, because "budet

studentom" (will be a student) is understood to be the result of "On budet chitat'" (He will read). (46a) however, for reasons of the meaning of chitat' (to read) is quite possible. (47) also does not render the meaning of simultaneity, but rather a resultative meaning. Conjoining two sentences where byt' functions as a mere tense marker results in sentence (48), where the second manifestation of byt' is redundant. In sentences (46) and (47) byt' is indispensable in the second conjoined sentence. This test of conjoining points in the direction that the tense marker byt' conjoins well only with another tense marker, i.e., where we have NP byt' V + NP byt' V.

3. Byt' as a copula. It is possible to assume that whenever byt' links a noun phrase with another noun phrase or with an adjective, it is a copula possessing semantic meaning. Its function is to connect two nominals in a definite way, namely with a meaning of "equality," "being the same," or "being two things at the same time":

(49) Ivan byl studentom (Ivan was a student);

(50) Ivan student (Ivan is a student);

(51) Ivan budet studentom (Ivan will be a student).

Křižkova (1970), in analyzing different verb phrases, says that a nominal predicate, as opposed to predicates with an object or an adverbial phrase, expresses a characteristic by means of the verb in such a way that the subject is either included into the class of some objects or is identified with an object, or certain qualities are ascribed to it.

The copula byt' is subject to changes in different tenses as was the case with the tense marker; in the past and future there is a surface realization of the copula. Křižkova (1970:23) mentions that in some constructions the congruent nominal in the predicate must be subjected to the instrumental transformation. In the present tense the surface realization is normally a zero,

but in cases of emphasis or definitions in scientific texts, byt' appears in the surface structure even in the present tense:

(52) Liubov' est' vysshee chuvstvo cheloveka (Love is the finest emotion in man);

(53) On est' luchshiĭ (He is the best).

The third person singular form est' is practically the only form of the paradigm; however, the archaic form sut' can be found in rare cases. The stylistic equivalent of the copula to be is iavliatsa, as illustrated in sentence (10).

Byt' as copula is always stative.

The copula gaps just like a full-fledged verb:

(54) On p'et vodku, a ia vino (He drinks vodka, and I - wine);

(55) Ivan budet studentom, a ia professorom (Ivan will be a student, and I - a professor);

(56) Ivan budet khoroshim, a Sasha plokhim (Ivan will be good, and Sasha bad).

It is impossible to conjoin a sentence with a copula with another sentence where to be is a tense marker, except in the past tense; in other words, the tense marker may not be reduced in the future.

(57) *On budet studentom i rabotat' (*He will be a student and work);

(57a) On budet studentom i budet rabotat* (He will be a student and will work);

(58) *On budet dobrym i rabotat' (*He will be kind and work);

(59) On byl studentom i rabotal (He was a student and worked).

(57a) is grammatical, because the tense marker in the second conjoined sentence is not reduced. The structure of (57a) is identical to that of (46), however the latter is ungrammatical, while the first is grammatical due to the semantic difference of the infinitives in these two sentences. If the order of the conjoined sentences is reversed, the results do not change.

(60) *On budet rabotat* i studentom (*He will work and a student);

(61) *On budet rabotat' i dobrym (*He will work and kind).

The results are also ungrammatical, if we attempt to conjoin a sentence containing a copula with a sentence where byt' is a link between a noun phrase and an adverbial phrase or an adverb:

(62) *On byl studentom i doma (*He was a student and at home);

(63) *On byl studentom i khorosho (*He was a student and well);

(64) *On byl studentom i vchera (*He was a student and yesterday).

So far an attempt has been made to establish a definite difference between the meaning and function of byt', the tense marker, and byt', the link between nominals; for the latter form the term 'copula' has been adopted in this paper.

4. Byt' with adverbs. Different kinds of adverbs bring out different functions of byt'.

4.1 Adverbs of time. The following examples show byt' linking a noun phrase with an adverb of time:

(65) Ivan byl rano (Ivan was early);

(66) *Ivan rano (Ivan is early);

(67) Ivan budet rano (Ivan will be early);

(68) Konferentsiia byla segodnia (The conference was today);

(69) Konferentsiia segodnia (The conference is today);

(70) Konferentsiia budet segodnia (The conference will be today).

In sentence (65) we are dealing with a synonym of to come, to go. Sentence (66) is ungrammatical, because, in isolation, it does not convey any meaning. This lack of meaning is due to the fact that it is not known what verb the adverb rano (early) modifies; the listener assumes that any verb could be implied: "Ivan gets up early," "Ivan works early," "Ivan comes early." For this reason it is assumed that (66) does not have byt' in the deep structure. In the past and future, where byt' appears on the surface, the fact that it is in a sentence where the subject is an animate noun it gives the meaning of

to come or to go. In (68), where the subject is nonanimate and nonliving and denotes some sort of an event, byt' is the equivalent of to take place.

Because of this semantic load it is possible to assume at this moment that these uses of byt' are deep structure phenomena.

4.2 Adverbs of manner. The adverb of manner, as shown in sentences (25)-(27), yields totally ungrammatical results except for the present tense: sentence (26) is grammatical, but is unrealistic without a context, such as "How is Ivan?" Or, perhaps, a regular transitive or intransitive verb could have been omitted. This shows that byt' does not link noun phrases with adverbs of manner, because it does not appear in the deep structure.

4.3 Adverbs of location. Byt' can also link a noun phrase with an adverb of location:

(71) Ivan byl doma (Ivan was home);

(72) Ivan doma (Ivan is home);

(73) Ivan budet doma (Ivan will be home);

(74) Ivan byl v klasse (Ivan was in the classroom);

(75) Ivan v klasse (Ivan is in the classroom);

(76) Ivan budet v klasse (Ivan will be in the classroom);

(77) Ivan byl u stola (Ivan was at the table);

(78) Ivan u stola (Ivan is at the table);

(79) Ivan budet u stola (Ivan will be at the table).

There is again zero realization of byt' in the present tense. This adverbial construction has to be brought out as an adverb of location rather than any adverb, because it behaves differently from the adverbial constructions of time or manner.

To establish the function of byt' with adverbial constructions of location (as well as time) containing an animate subject we can try to substitute one

of the equivalents (1)-(10). We find that the possible substitutes are the verb to go, to be found, to come, to drive, to visit (Kochetkova and Matreeva 1970:52). Thus, "Ivan was home" may be the equivalent of "Ivan was to be found home," as well as "Ivan went home." This will be an important distinction for understanding the difference between the negation of these two sentences. These differences in meaning point to a deep structure origin of this copula. Catherine Chvany (1970) also assumes that byt' of existence, byt' of occurrence and byt' of location are "true verbs," or cases of "deep structure copula" as as I would like to label them.

Byt' of occurrence is nonstative, while the others are stative. Stativeness is determined not only by the contextual features, but also by the mandatory absence of byt' in the present tense, where it is stative:

(80) Ivan doma (Ivan is home);

(81) Ivan v klasse (Ivan is in the classroom);

(82) Ivan u stola (Ivan is at the table);

(83) Kniga na polke (The book is on the shelf);

(84) Kniga pod stolom (The book is under the table);

(85) Kniga tut (The book is here).

The lexical equivalent for this form of byt' is nakhodit'sa (to be found).

The test of gapping applied to constructions with adverbs of time and location yield results identical to those obtained in sentences with regular verbs:

(86) Ivan byl rano, a Sasha pozdno (Ivan was early, but Sasha was late);

(87) Ivan budet doma, a Sasha v klasse (Ivan will be home, but Sasha will be in the classroom);

(88) Kniga byla na polke, a karandash v iashchike (The book was on the shelf, but the pencil was in the drawer);

(89) Kniga na polka, a karandash v iashchike (The book is on the shelf, but the pencil is in the drawer).

Conjoining shows the following results:

(90) *Ivan budet rano i budet studentom (Ivan will be early and will be a student);

(91) *Ivan budet rano i budet khoroshim (Ivan will be early and will be good);

(92) *Ivan budet rano i budet rabotat' (Ivan will be early and will be working);

(93) Ivan budet doma i budet studentom (Ivan will be home and will be a student);

(94) Ivan budet doma i budet khoroshim (Ivan will be home and will be good);

(95) Ivan budet doma i budet rabotat' (Ivan will be home and will be working).

The constructions of time do not conjoin with sentences where byt' is a copula or a tense marker, but the constructions of location do.

4.4 Adverbs of location denoting possession. A special case of NP byt' Loc in reversed order (Loc byt' NP) renders the meaning of possession. The word order is crucial for regular non-emphatic sentences of possession:

(96) U Ivana est' kniga (Ivan has a book);

(97) U Ivana byla sobaka (Ivan had a dog);

(98) U Ivana budet lakei (Ivan will have a butler).

Otherwise a very emphatic intonation is necessary in order to maintain the meaning of possession without the reversed word order:

(99) Kniga est' u Ivana (Ivan does have a book).

Sentences with the subject predicate order without the surface realization of byt' do not mean possession, but rather presence in a location.

(100) Kniga u Ivana (The book is at Ivan's);

(101) Sobaka u Ivan (The dog is at Ivan's);

(102) Lakei u Ivana (The butler is at Ivan's).

The same constructions, but in the predicate-subject order render the meaning of a less permanent ownership or ownership in the presence of the speaker:

(103) U Ivana kniga (Ivan has a book);

(104) U Ivana sobaka (Ivan has a dog);

(105) U Ivana lakei (Ivan has a butler);

while sentences with the surface realization of byt' definitely render the meaning of permanent and general possession.

Another requirement for rendering the meaning of possession is that the predicate noun phrase be <+living>, as in

(106) U rosy shipy (The rose has thorns);

and not in

(107) U stola Ivan (Ivan is at the table).

The latter, of course, renders the meaning of 'Ivan is at the table' rather than 'Ivan is owned by the table'. In order to use the verbal equivalent of byt' of possession, namely imet', the noun phrase of the predicate must be the subject, as in

(108) Rose imeet shipy (The rose has thorns).[4]

Sentences without the surface realization of byt', where the noun being owned by someone is animate, or especially, human, are ambiguous: sentences (102) and (105) may mean that the butler went to Ivan's and is with him now.

Gapping may occur here as well as in sentences with regular verbs:

(109) U Ivana est' lakei, a u Sashi povar (Ivan has a butler, and Sasha has a cook);

No conjoining is possible when we deal with sentences of possession (Loc byt' NP) on one hand, and sentences of identity (NP byt' $\left\{\begin{matrix}NP\\Adj\end{matrix}\right\}$) on the other:

(110) *U Ivana byl lakei i byl uchitelem (Ivan had a butler and was a teacher);

(111) *U Ivana byl lakei i byl khoroshim (Ivan had a butler and was good);

(112) *U ivana byl lakei i byl doma (Ivan had a butler and was home);

(113) *U Ivana byl lakei i rabotal (Ivan had a butler and was working).

In sentences denoting possession the form byt' seems to be stative.

It is obvious from the examples in this chapter, that byt' cannot be used with the adverbs of manner, even if there is no verb on the surface structure. Such is the case in sentence 26: the tests have shown that byt' does not exist on the level of deep structure.

However, byt' used with adverbs of time and place has a very definite meaning as well as semantic synonyms with a strong semantic load. The gapping test shows a behavior identical with full-fledged verbs. It is also true that one may not conjoin a sentence where byt' links a nominal with an adverb with a sentence where byt' links a nominal with a nominal. This is the case simply because of an entirely different function of these two types of byt' and therefore, a certain "independence" in the sentences conjoined. Yet, the form byt' in this chapter conjoins perfectly well with full-fledged lexical verbs. All these facts point in the direction that byt', which links nominals with adverbs, may be considered a deep structure phenomenon.

5. Byt' as a full-fledged verb. There are numerous cases where byt' does not link the subject with another part of speech, but rather plays the role of a regular intransitive verb:

(114) Pravda est' (Truth is).

Among all the different functions of byt' this usage is the only real lexical verb, because it may be the only member of a verb phrase and may be modified by adverbs. It is stative and does not need to derive its stativeness from the contextual features in the verb-phrase.

At first glance it may look like NP byt' $\begin{matrix}\text{Time}\\ \text{Loc}\end{matrix}$:

(115) Pravda budet vsegda (Truth will be always)

(116) Podvig est' i v sražen'i, podvig est' i v bor'be...(Heroism is in battle, heroism is in fighting...),

but there is a difference between these examples and the copula simply because

there must be the surface realization of byt' in these sentences, in the present tense. The verb which is the lexical equivalent of this verb is sushchestvovat' (to exist).

6. Questions and negations. It is unfortunate that the only form in Russian used to question a verb is "chto delaet?" It cannot be used for any of the uses of byt' described above. It is not only because delat' is nonstative, but also because of the presence of chto, the direct object, which presupposes that 'someone is doing something'; but even the most "verb-like" usage of byt' as in (114), completely excludes any direct object or any transitive activity.

The constructions outlined above may be subjected to question transformations which will yield a wh-question, an intonation question, a -li-question, or a tag question.

(117) Chto Ivan budet delat'? (What will Ivan do?);

(118) Kem Ivan byl? (What was Ivan?);

(119) Kto Ivan? (Who is Ivan?);

(120) Kem Ivan budet? (What will Ivan be?);

(121) Kakim Ivan byl? (What was Ivan like?);

(122) Kakoi Ivan? (What is Ivan like?);

(123) Kakim Ivan budet? (What will Ivan be like?);

(124) Chto s Ivanom bylo sdelano? (What was done with Ivan?);

(125) Chto s Ivanom sdelano? (What is done with Ivan?);

(126) Chto s Ivanom budet sdelano? (What will be done with Ivan?);

(127) Kogda Ivan byl? (*When was Ivan?);

(128) *Kogda Ivan? (*When is Ivan?);

(129) Kogda Ivan budet? (When will Ivan be?);

(130) Kak Ivan? (How is Ivan?);

(131) Gde Ivan byl? (Where was Ivan?);

(132) Gde Ivan? (Where is Ivan?);

(133) Gde Ivan budet? (Where will Ivan be?);

(134) U chego student? (What is the student at?);

(135) Kto u Ivana? (Who is at Ivan's?);

(136) Chto u Ivana? (What does Ivan have?);

(137) Kto u Ivana est? (Whom does Ivan own?);

(138) Chto u Ivana est'? (What does Ivan have?);

Intonation questions:

(139) Ivan budet rabotat'? (Will Ivan work?);

(140) Ivan student? (Is Ivan a student?);

(141) Ivan dobryi? (Is Ivan kind?);

(142) Ivan priglashon? (Is Ivan invited?);

(143) Ivan u dveri? (Is Ivan at the door?);

(144) Ivan u professora? (Is Ivan at the professor's?);

(145) Kniga u Ivana? = U Ivana kniga? (Is the book at Ivan's?);

(146) U Ivana kniga? (Does Ivan have a book?);

(147) U Ivana povar? (Does Ivan have a cook?);

(148) U Ivana est' kniga? (Does Ivan have a book?).

In the -li-questions the word questioned is placed in the beginning of the sentence and the question particle -li follows the word questioned. This can be done with any nouns, adjectives, verbs, adverbs.

In case of the tag questions ne pravda or ne nravda li (with rising intonation) is attached to the statement.

Essentially, one rule could give us all the question transforms: the word questioned is subjected to intonation or it is preposed with the particle -li following it, or it is preposed and replaced by the respective question word. In case of a tag question, the tag has to be attached.

Negation operates in a similar manner: nouns, adjectives, verbs, adverbs or prepositional phrases may be negated by preposing ne before them. Verb negation is the unmarked form of negation.

It is interesting to point out here that if one judged merely by the surface structure, then NP byt' Loc (Ivan doma) would appear to have two negative transformations:

(149) Ivan ne doma (Ivan is not home);

(150) Ivana net doma (Ivan is not home);

and so would the past and the future tenses:

(151) Ivan ne byl doma (Ivan was not home);

(152) Ivana ne bylo doma (Ivan was not home);

(153) Ivan budet v klasse (Ivan will be in class);

(154) Ivana ne budet v klasse (Ivan will not be in class).

This is, however, not true; because "Ivan byl v klasse" is a perfect case of ambiguity: it may mean 1) that Ivan was present in the classroom, and 2) it may mean that Ivan went to the classroom and came back. This distinction comes out very clearly after the negative transformation is applied: in the case of the absence of a person we obtain a transform with the logical subject of the verb byt' in the Genitive case, and, in the case of a living being's not having been to a place, the subject of the verb to be remains in the Nominative case. The first type of a negative transform may be explained as a sentence where a dummy subject of a neutral type it is inserted: 'Of Ivan it was not there'.

It becomes more complicated when negative questions have to be generated. It seems more economical to subject a sentence to a negative transformation first and then to the question transformation, because in some cases the highest pitch of question intonation must fall on the particle ne which must be introduced by negation first, as in:

(155) On ne byl studentom?

The rule of subject raising may be used as a test to show that byt' behaves just like a regular verb in an embedded sentence. Only such verbs as schitat' (to consider), nakhodit' (to find) (of which there are very few) in the main sentence will trigger subject raising. Subject raising must be stated in such a manner as to exclude true verbs and tense markers from the complements that undergo raising. The same can be said about the surface realization of byt': it must be excluded from the complement. If the complement is "Ivan student" or "Ivan budet studentom," subject raising results in "Ia schitaiu Ivan studentom," or "Ia budu schitat' Ivana studentom." There is no way of expressing tense in the complement.

Subject raising may be applied only to sentences in which byt' is used as a copula, and not to sentences containing any other byt'. This fact distinguishes the copula from a true verb on one hand and, on the other hand, for reasons outlined baove (such as the existence of lexical equivalents and others), the copula could not be a surface structure insert.

7. Concluding remarks. As a result of tests and operations outlined in the chapters above, there seem to be four basic types of byt':

1. the tense marker,
2. the copula,
3. the form that links the subject with an adverb,
4. the true verb.

If the first is a surface-structure insert, then the others - as a result of what has been attempted to show here - should be introduced in the deep structure. At this point, however, it is not clear at which levels of depth the second, the third and the fourth types of byt' are inserted. The fact that they are introduced at different levels of depth is a necessary assumption resulting partly from the tests carried out, partly from native intuition. Establishing

the variants of byt' in more exact terms would depend on further research in whether tense should be treated as a note or a feature, and on the solution of many other problems in Russian, such as the types of complements byt' can take (Tuniks, 1969), and the formation of imperatives.

My reach possibly exceeds my grasp, but, perhaps, it may not be too much to assume that this analysis could serve as a step towards the discovery of some regularity in this corner of the jungle of the Russian grammar.

NOTES

1. Byt' is the Russian infinitive form of the Russian verb to be. In the present tense there are only two forms: est', which is the third person singular, and sut', which is more a different stylistic form of est', rather than the third person plural, which it is in old Russian. In the future tense there is a complete paradigm: budu, budesh, budet, budem, budete, budut. In the past tense the forms differ only according to gener and number: byl, byla, bylo in the singular, and byli in the plural. The imperative forms are bud' in the singular or familiar, and bud'te in the plural or polite.

2. See section 4.1 for an explanation of why (23) is ungrammatical.

3. (26) does occur; it is not an instance of the copula, but rather of a deleted verb.

4. This is only an approximation to the exact conditions for this construction.

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